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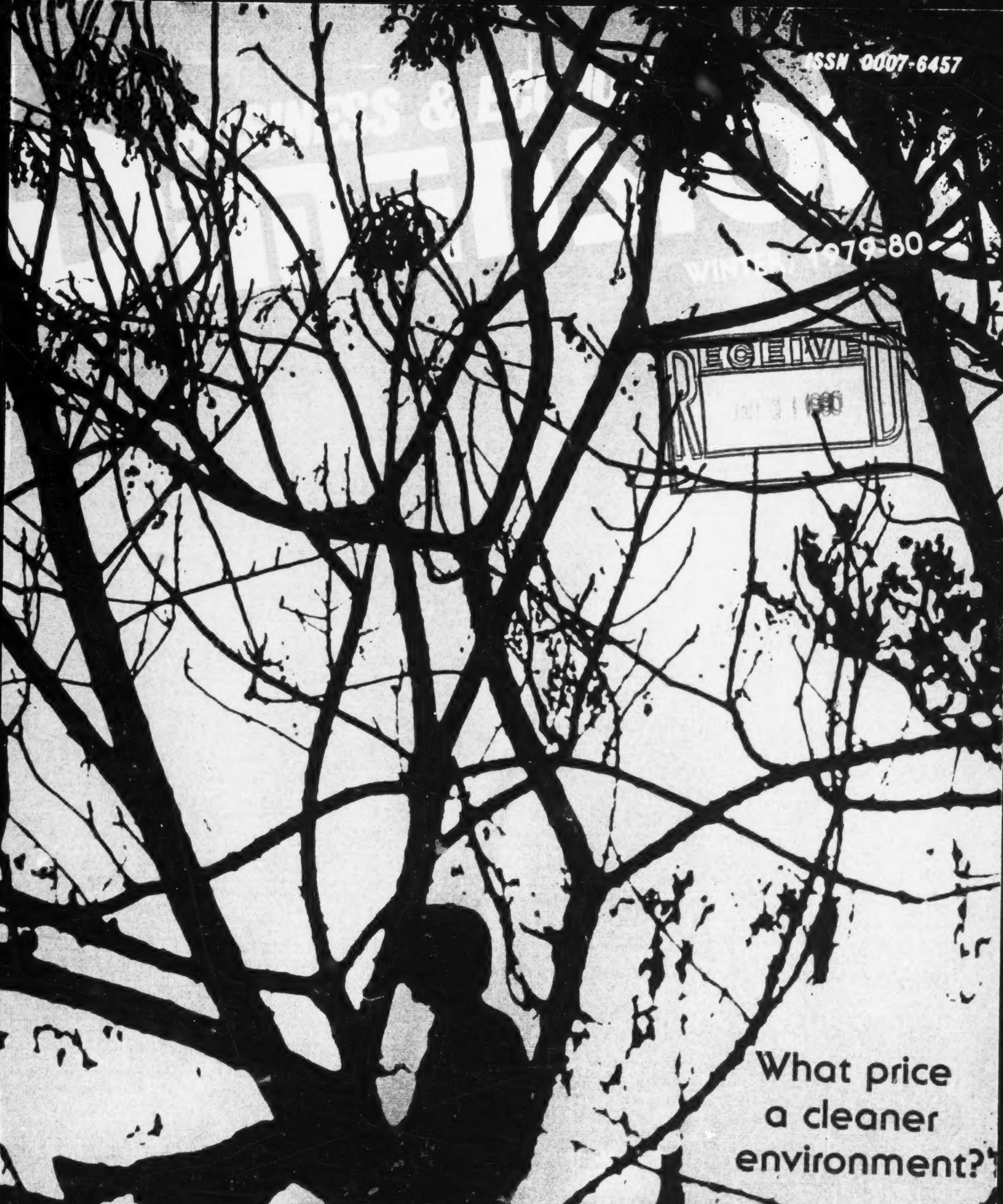
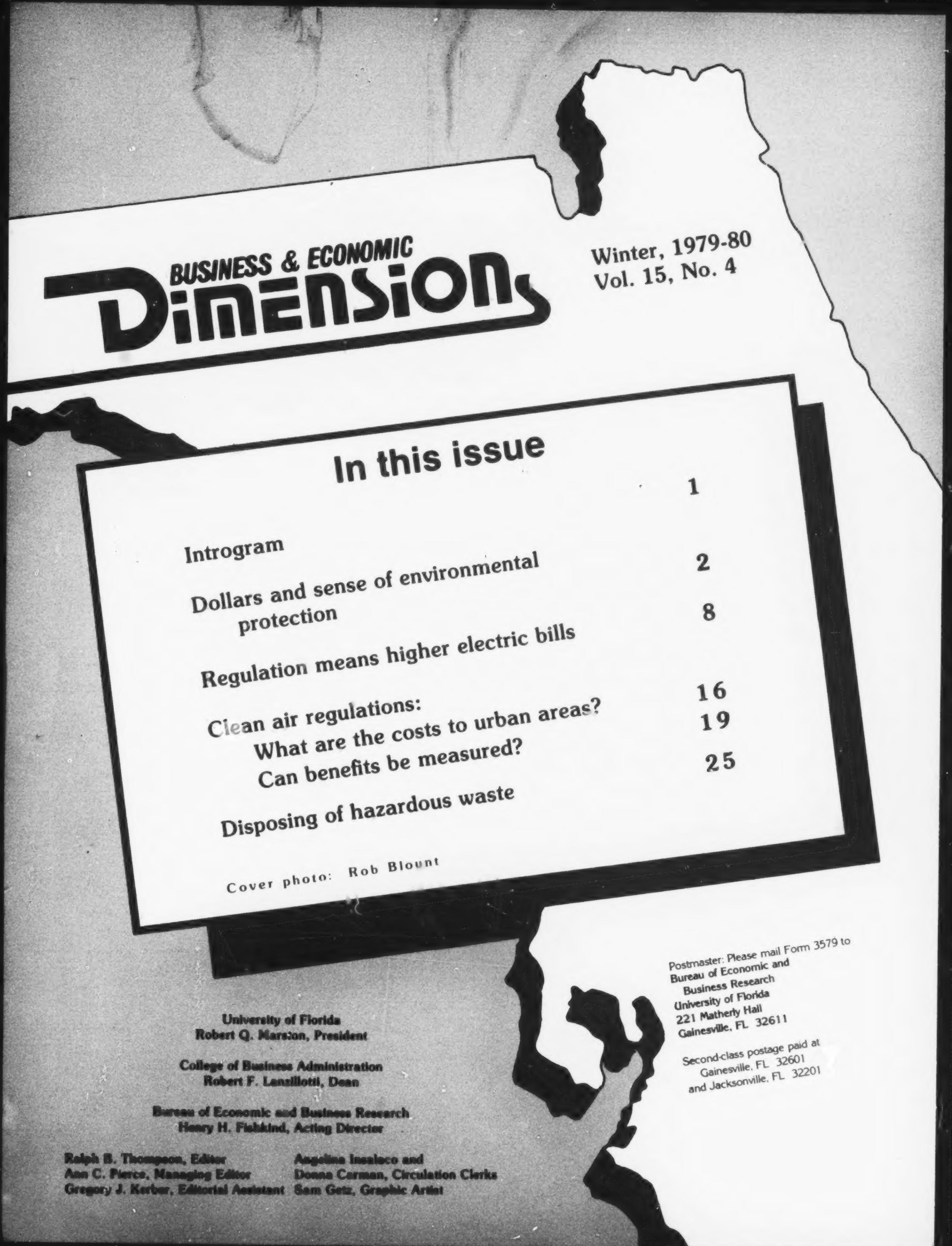


What price
a cleaner
environment?



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In this issue

Introgram 1

Dollars and sense of environmental protection 2

Regulation means higher electric bills 8

Clean air regulations:
What are the costs to urban areas? 16
Can benefits be measured? 19

Disposing of hazardous waste 25

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introgram

There seems to be some challenging of the widely held belief that there should be continued expansion of programs to protect our environment. Voices are raised to insist that industries and public agencies cannot afford to pay the costs involved. The pros and cons of this question are weighed in the first article in this issue by Elizabeth Sheiry Roy of the Florida Department of Environmental Regulation (DER).

A more specific analysis of the costs of environmental regulation—to investor-owned utilities in the state—is presented by Professor Sanford Berg of the Florida faculty in the second article.

Following is a summary of a report detailing the economic impact of proposed clean air regulations on the eight Florida counties which do not meet national ambient air quality standards. A subsequent article is an account of a study by Dr. Jerome Milliman, of the University of Florida faculty, which sought to measure the benefits of air quality regulations in Tampa.

Also included in this issue is a brief summary of a final report of the results of a study performed for the DER by a Florida State University team on the economic impacts to be expected from proposed regulations regarding the control of hazardous industrial wastes.

A number of persons in addition to those named in the article bylines should be mentioned for their contributions to this issue. They are Thomas A. Lynch, chief economist for the DER, who supplied data and advice; and Ann Pierce, Greg Kerber, and Randy Forde of the Bureau of Economic and Business Research staff, who drafted the articles from the original reports.

—Ralph B. Thompson

DOLLAR$ AND OF ENVIRONMENTAL PROTECTION

Elizabeth Sheiry Roy

Economic Planner
Florida Department
of Environmental Regulation

This article is condensed from a report issued by the Office of Economic and Program Evaluation, Florida Department of Environmental Regulation, in August, 1979. The author wishes to acknowledge the assistance of Dale Hazelett, graduate student in economics at Florida State University, in collecting and compiling background material.

In the decade of the seventies we have witnessed the emergence of two interesting—and countervailing—public sentiments: a dramatic increase in environmental awareness on one hand, and a revolt against government regulation on the other. It has become increasingly evident that unless Americans learn to treat the environment with more respect, their health, mental well-being, and life expectancy are at stake. At the same time, the country's deteriorating economic conditions have precipitated widespread public concern and increasing opposition to government regulation—environmental regulation in particular.

We know we are paying for pollution control and abatement with dollars, of course. We are also repeatedly told that a cleaner environment can be achieved only at the expense of increased inflation, lower productivity, and higher unemployment as well.

The sheer magnitude of direct expenditures for pollution abatement, combined with the specter of financing a cleaner environment with reduced productivity, lost jobs, and higher prices, has caused many concerned citizens to question the value of increasingly strict pollution abatement standards. In fact, there is a growing trend toward relaxing existing environmental standards in an effort to reduce the economic burden on taxpayers and industry. We are being told that we simply cannot afford to clean up our environment. The costs are just too great.

> ***. . . sorting out the dilemma of environmental protection on one hand and economic vitality on the other is a major task, one which requires difficult decisions which will affect us all . . . .***

But there is another side of the coin: the benefits we are receiving in exchange for those costs. The question, then, is What are the cumulative impacts of environmental regulation on our overall quality of life? Are we receiving returns commensurate with the investment we are making to protect and preserve our environment?

Why care about pollution?

The harmful effects of a dirty environment on our quality of life are often cited as the major costs of pollution: damaged health and shortened lifespans due to environment-related illnesses; time lost from work along with associated loss of productivity and income; and loss of natural areas which provide recreation and much-needed relief from day-to-day tensions. Today chronic diseases such as cancer, strokes, heart disease, and diabetes are the chief killers. While the exact causes of these and other diseases are still relatively unknown, medical research is producing mounting evidence that the environment is indeed a major factor in virtually all these illnesses.

Potentially dangerous substances have frequently been widely distributed into our environment. Known carcinogens in the form

SENSE

of asbestos fibers are being discovered in the lungs of factory workers, garage mechanics, and consumers using products such as hairdryers containing that material.

Laboratory experiments indicate that a widely used industrial chemical called PCB (polychlorinated biphenyl) causes cancer in animals. The residue of this chemical is an invisible substance which mixes with air and water and has been found in fish and other foods. Even mothers' milk has been contaminated by this unseen threat to our health.

A manufacturing plant on a Virginia river released a pesticide called Kepone which poses a serious threat to the entire life system of Chesapeake Bay.

Lead poisoning constitutes a major health problem for factory workers throughout the country. In 1975, for example, it was responsible for symptoms such as nausea, abdominal cramps, irritability, and tremors among half the workers in a Salt Lake City lead smelter.

These are but a few of the ways in which chemical substances are known to affect us. The reason we are unsure of the precise impacts of these and other substances is that time lag is a critical factor in trying to identify and combat these environment-related diseases. An incubation period of twenty to forty years is not uncommon with cancer. Heart attacks commonly occur after age forty. Respiratory ailments such as fibrosis and emphysema may take decades to develop.

Because the dramatic rise in the use of chemicals began as recently as the early sixties, it will be years before the true impacts of these substances will be known.

The new pollutants are insidious in that they are frequently not readily apparent to the naked eye and are far more difficult to trace than other pollutants with which we have previously dealt. While it is difficult to document the cause/effect relationship between the environment and illness and mortality, mounting evidence points strongly in that direction.

Toxic substances released into the environment pose serious threats to our physical well-being. This is only part of the problem, however. Pollutants entering the air and water have very real effects on our economic well-being as well. The impact of pollution on property values is one case in point. A recent study of Los Angeles neighborhoods indicates that property values are negatively affected by contact with or close proximity to just one form of pollution—air pollution.

In addition to the impact on human health and property values, pollution also has a substantial impact on our opportunities for leisure and recreation, and on the economic vitality of state and local governments. Many sections of this country are heavily dependent upon their environmental amenities as an economic base for employment and income. In 1976, for example, tourists contributed more than $10 billion to Florida's economy. The quality of the state's unique natural environment was the principal attraction for the majority of these visitors. Aside from loss of recreational opportunities for permanent residents, therefore, pollution in Florida and other such areas can cost literally billions of dollars in foregone taxes and revenues upon which local and state economies are heavily dependent.

The case against environmental regulation

"Stagflation" refers to a state of the economy in which both inflation and high unemployment exist simultaneously, a phenomenon characteristic of the 1970s. According to some observers, environmental protection laws and regulations are having an adverse affect on the economy by contributing to stagflation.

The reasoning generally goes like this: Companies have a limited amount of investment capital at their disposal at any given time. Future returns and profits depend on wise use of those funds. Because of the high cost of complying with environmental regulation, business capital must be diverted from improving or expanding industrial productive capacity, and must instead be used to acquire equipment and technology designed to reduce pollution generated by day-to-day operations. This means spending scarce capital without an increase in production. The

result, the argument goes, is higher production costs and lower productivity for business, and higher product prices for consumers.

In some instances, cost increases may force closure of plants and layoff of workers. Those firms which do continue to operate incur higher production costs leading to higher product prices which in turn contribute to inflation—inflation which will be exacerbated by the accompanying decline in employment opportunities.

The bottom line of this scenario is that efforts to clean up the environment and improve our quality of life will find us with somewhat cleaner surroundings at the expense of higher unemployment, lower productivity, and higher prices. The outlook is bleak indeed.

The fundamental question is: Does such a scenario depict reality? Undoubtedly the cost of getting rid of pollution is already high, and getting higher. A look at the figures is informative. The President's Council on Environmental Quality (CEQ) differentiates between total pollution abatement expenditures and "incremental" expenditures resulting from compliance with federal environmental legislation. Incremental outlays, then, represent expenditures in excess of those that would have been made in the absence of environmental laws. In 1978, CEQ reported that incremental pollution control expenditures during the period 1976-1985 were expected to total $289.1 billion, and predicted that government and private industry would spend a total of $554.3 billion on all types of pollution control during the same period. Expenditures in 1977 for pollution control alone "totalled $40.6 billion, or 2.1 percent of that year's gross national product (GNP)."[1]

. . . while environmental regulations have eliminated some 20,000 jobs, 600,000 new jobs have been created by expenditures on pollution control. . . .

The economy and the controversy

A cleaner, healthier environment versus inflation, unemployment, and lower productivity—this is the heart of the controversy. Sorting out the dilemma of environmental protection on one hand and economic vitality on the other is a major task, one which requires difficult decisions which will affect us all.

In order to make the best decisions, two basic questions must be answered. First: Which will ultimately cost us more or provide more benefits—cleaning up, or abandoning further attempts to rid ourselves of pollution? Second, and equally important: Is this really an either-or choice? In other words, must we sacrifice jobs and endure higher inflation rates in order to clean up our environment? Despite the facts and figures presented earlier, it is not at all clear that we are actually confronted with such a drastic choice.

The importance of answering these questions has encouraged new efforts to identify the true impacts of pollution control. A study was just completed for the CEQ covering the period 1970-1978 and using a macroeconomic model to provide estimates of how economic conditions would have deviated from those that actually existed if there had been *no* incremental pollution control costs. It is important to note that benefits resulting from pollution control expenditures were intentionally excluded from the analysis. In other words, a cleaner environment was assumed to be of no value to any of us.

Despite this somewhat biased approach, the conclusions of this study are striking. Despite industry's predictions and warnings, there has been no absolute loss of jobs for the sake of a cleaner environment. Just the opposite has occurred. Jobs created by the pollution control equipment and construction supply industries have more than offset any loss in jobs due to environmental regulation by a consistent 0.2 percent.

EPA estimates corroborate these findings. Estimates by that agency indicate that while environmental regulations have eliminated some 20,000 jobs, 600,000 new jobs have been created by expenditures on pollution control. This means a net gain of 580,000 jobs as a direct result of pollution abatement and control.

The macroeconomic model cited earlier was also used to predict the impact of pollution control on inflation. The results indicate that pollution abatement produces an average annual increase in the price level of 0.2 percent. In other words, if all pollution control efforts were discontinued, our annual inflation rate would be reduced at most by only about one-fifth of 1 percent.

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[1] "How Much for Environment?", *Engineering News-Record* (June 29, 1978), pp. 17-19.

> ***. . . some encouraging and perhaps surprising results . . . indicate that measures taken to protect our environment can actually exert positive impacts on our economy. . . .***

What are we getting for our money?

What exactly are we getting for the enormous amounts of money being spent on pollution control? To obtain a meaningful answer to this question, it is helpful to establish a common denominator by which to make comparisons. The costs and benefits of pollution control as a percentage of GNP is one such denominator. GNP is used to measure the total amount of final goods and services produced in the U.S. economy in a given year. It may also be thought of as the total national income for a given year. In 1977, GNP was $1,890 billion. In that same year, pollution control expenditures totaled approximately $40 billion, or about 2.1 percent of GNP. One note of caution, however: this $40 billion includes *all* spending on environmental protection—even those expenditures which would have been made in the absence of environmental statutes and regulations. Consequently, it is somewhat overstated.

Data used to calculate GNP readily provide the costs of environmental protection because they are computed in terms of the artificial medium of exchange—money. Benefits of an improved environment, however, tend to pass directly to the citizen without an intermediate exchange of money. In addition, most of the benefits resulting from pollution abatement are very hard to convert to dollar values. The quality of life—the value we place on our environment—simply transcends quantification in terms of dollars.

In the past, this quantification problem has often led to confusion and misunderstanding and has frequently been used by special-interest groups anxious to exaggerate the negative impacts of regulation on the economy. Too often in the past, there has been a careful accounting of pollution cleanup expenditures while benefits have largely been ignored. This erroneous counting then becomes the basis for the "too expensive" argument against pollution abatement. Accurate counting requires careful estimates of the benefits to citizens translated into dollar values and then matched against spending. Recent studies are making progress in quantifying benefits, but much work remains to be done before we will know the true value of the benefits we are receiving.

Despite the incomplete information regarding the value of benefits, results of recent studies do provide some idea of their potential magnitude. An EPA study released on March 29, 1979, indicated that a 60 percent reduction in air pollution—the EPA target for the 1980s—would produce total annual benefits of $36 billion. This is about 1.9 percent of the 1977 GNP, a figure which compares favorably with the earlier figure for the current expenditures in the economy for all kinds of pollution abatement and control.

While the figure of $36 billion annually in health benefits due to air pollution abatement is indeed huge, it does not begin to capture the total amount of health benefits provided by cleaning up our environment. The problem of water pollution is certainly equal to that of air pollution in this nation, and cleaner water is bound to improve our health. While no bottom line estimate of health benefits accruing from improved water quality currently exists, there is good reason to believe that these benefits are at least as great as those associated with clean air. In 1975, for example, EPA's J. Edward Singley estimated that the annual cost of infectious disease connected with drinking water alone was more than $156 million.

Water pollution also affects property values. Results of a 1973 analysis of water pollution abatement benefits showed that a reduction in pollution in the nation's waters "to levels which are not inhibiting to desirable life forms or practical uses and which are aesthetically agreeable would increase the total capital value of [the nation's] existing residential and recreational property . . . [by about] $1.3 billion . . . ."[2] The annualized value of these benefits is $76 million.

These, then, are but a few examples of benefits which have been quantified and can now be counted. They indicate that the dollar

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[2] David M. Dornbusch and Stephen M. Barrager, *Benefit of Water Pollution Control on Property Values*, prepared for the U.S. Environmental Protection Agency (October, 1973), p. 1.

> ***. . . at some point, the gains from improving the environment are outweighed by the costs: the loss of resources which could have been used for meeting other public and private demands. . . .***

values of the benefits we are receiving from pollution control are large indeed—well in excess of expenditures.

When looking at what we are getting in exchange for dollars spent on cleaning up the environment, however, there is another crucial issue that must be considered: the cost of *not* cleaning up. For if efforts to control and abate pollution were diminished or curtailed, the state of the environment and the economic body of the country would not remain constant. Our surroundings would deterioriate and our physical and economic health would decline.

Expenditures to clean up contamination of our environment constitute yet another category of costs that offset the cost of pollution prevention—a category which is currently receiving much attention nationwide. In the absence of proper governmental regulation and supervision, improper disposal of hazardous substances has been occurring for years. These substances have now come back to haunt us and they represent a very real threat to the lives and health of citizens throughout this country. Whereas proper disposal would have necessitated increased initial capital outlay, cleanup costs to correct the dangerous situation which now exists will be enormously greater.

What the people want

Despite the obvious need for additional research, certain conclusions can be drawn from the information currently at our disposal. Contrary to many claims, environmental regulation actually creates job opportunities, its effect on inflation is modest at best, and the benefits—though difficult to quantify—appear to be immensely greater than the costs. In light of these findings, it is interesting to examine current public opinion on the issue of protecting our environment.

The results of the 1979 Florida Annual Policy Survey show that the overwhelming majority of Florida's citizens supports strong environmental protection measures. Opinions on state environmental spending are indicative of the degree of this public commitment. Of the total responses, 60 percent favored "increased spending to improve the quality of the state's environment."[3] The study further questioned citizens as to which of two alternatives was more important: attracting more industrial development or having strict enforcement of environmental standards. The reply was 71 percent in favor of strict enforcement standards. These results are especially striking in a time generally characterized by a popular outcry for tax relief and by a rebellion against government regulation.

On the national level, a 1978 opinion poll conducted by Resources for the Future (RFF) found that respondents expressed deep concern about inflation and taxes, but "their support for environmental protection [was] strong and unwaivering. . . ."[4] In order to determine the relative importance of environmental issues to citizens, a number of tradeoff questions were posed. One question required respondents to choose between higher prices to protect the environment and lower prices with more pollution. Of those interviewed, 62 percent chose higher prices and environmental protection. Other questions pertaining to the overall level of spending showed that 52 percent believed too little is being spent on environmental protection, while 53 percent responded that "protecting the environment is so important that requirements and standards cannot be too high and continuing improvements must be made regardless of cost."[5]

Good news on the horizon

The experience of a number of industries provides some encouraging and perhaps surprising results, results which indicate that measures taken to protect our environment can actually exert positive impacts on our economy. In a growing number of cases, the very actions taken by firms to improve the quality of our environment have resulted in a substantial *increase* in corporate profits. These enlightened industries have acknowledged the need to get at the root of

[3] Russell J. Dalton and Anneliese Reich, *The 1979 Florida Annual Policy Survey: Assessing Public Needs and Policy Interests* (April, 1979), p. 11.

[4] "The Public Speaks Again: A New Environmental Survey," *Resources* (September-November, 1979), p. 1.

[5] Ibid., p. 3.

the pollution problem—to prevent pollution rather than clean up afterward—and they have devised cost-effective ways of doing so.

According to Carl Gerstacker, chairman of the board of Dow Chemical:

> - The Dow Corning Corporation of Hemlock, Michigan invested $2.7 million to recover chlorine and hydrogen previously lost to the atmosphere. . . . The savings in operating costs are $900,000 per year. . . .
> - Hercules spent $750,000 to reduce the solids discharged into the Mississippi and is now saving $250,000 yearly in material and water costs as a result.
> - Seven pollution control projects . . . installed in [Dow's] 14 latex plants . . . at a capital cost of about $2 million are expected to cut operating costs by almost $2 million per year.
> - [A] project to save . . . chlorinated solvents [at] Dow's Freeport, Texas plant expects to save $100,000 per year with a capital investment of only $125,000.[6]

Dow's experience has been dramatic, but certainly not unique. Consider the following:

> - Union Camp Corporation turns mill wastes worth about 8 cents a pound into flavors and fragrances worth more than a dollar a pound. . . . Since 1967, when Union Camp began producing the rose-smelling chemical Geranoil from pine wood turpentine, its chemical sales have grown to more than $100 million per year.
> - St. Regis Paper Company sells a black oily waste from its pulp operations for as much as $300 a ton—more than many grades of paper.
> - Westvaco Corporation has installed an Ecodyne Corp. evaporator system at its Covington, Virginia plant that will eliminate odors and also save the company as much as 200,000 barrels of oil a year.
> - A study of a poultry processing plant by the U.S. Environmental Protection Agency in 1974 revealed [that] . . . [b]y modifying equipment and processes the average daily potable water use was reduced by 32 percent. The total investment in changes was $93,000 and the total annual capital and operating costs were $31,000. By reducing the annual water use . . . the company saves about $40,000 a year on its water bill.[7]

These are but a few examples of innovative—and profitable—preventive approaches to a cleaner environment. As technology and entrepreneurial expertise are used to attack the problem, these savings, sales, and other benefits to firms and industries are apt to increase in the future. The preventive approach is doubly advantageous because polluting materials released into the environment frequently represent wasted materials and wasted energy. In an age of dwindling supplies of natural resources and energy, this nation can ill afford to waste either. The new pollution-prevention approach, therefore, serves a dual function: resource conservation and increased profits. As Dow's chairman tells us:

> My message today is very simple: it is that solving pollution problems is good business as well as good citizenship. It can be profitable so let's get at it, with energy and enthusiasm, now.
>
> We've been in the pollution fighting game for less than a decade. By most standards, this is a very short period of time. There is much to be learned and room for improvement on both sides—industry and government. We do know that the benefits we are receiving are significant and, as the examples above indicate, cheaper, more effective ways of dealing with pollution are emerging which will reduce costs and further increase benefits in the future. The key is responsiveness . . . a responsive regulatory system and a cooperative attitude on the part of industry. Hopefully, the second decade of environmental regulation will be characterized by a mutually responsive approach to pollution prevention and control, for the preservation of our environment—our quality of life—is at stake.[8]

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[6] Jay Landers, "The Economic Case for Environmental Protection," *The Legislative Report* (May, 1977) p. 31.

[7] Landers, op. cit., p. 30.

[8] Landers, op. cit., p. 29.

Regulation Means Higher Electric Bills

--but the alternative could be worse

Sanford V. Berg

**Associate Professor of Economics
University of Florida**

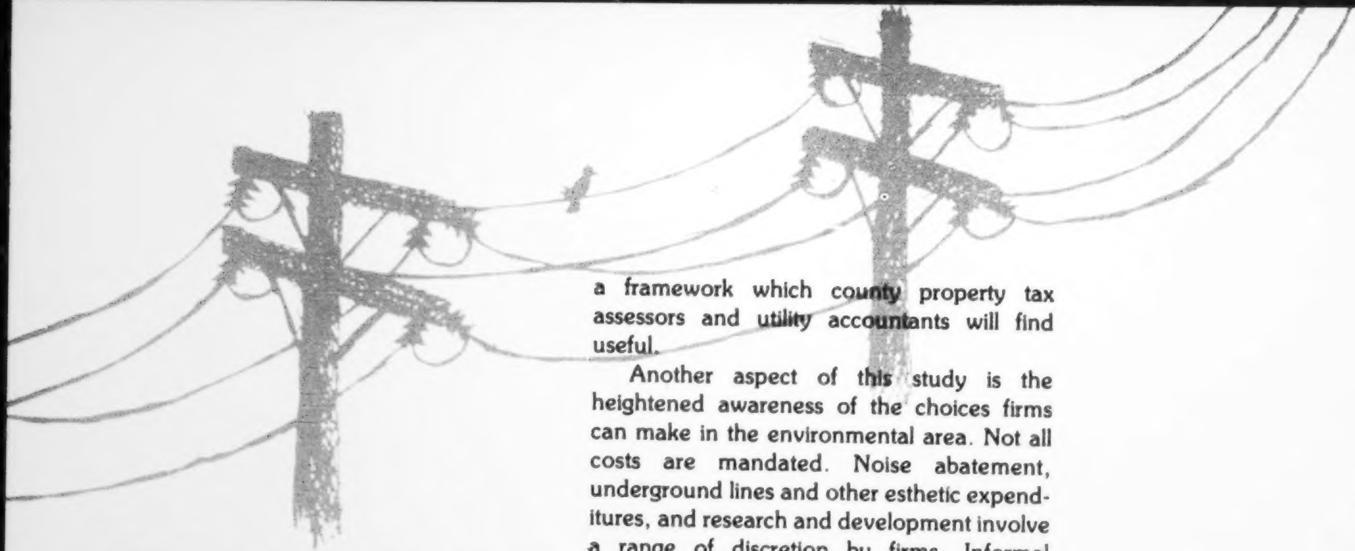
The costs of environmental regulation of electric utilities in Florida are substantial and rising rapidly. Although various regulations raise customer bills directly (since production costs increase when control strategies are imposed), the absence of regulation could leave consumers even worse off, through illness, reduced quality of life, and other social costs. This study focuses only on the direct costs reflected in higher customer bills, and leaves unaddressed the question as to whether there is too little, or too much, environmental regulation in Florida.

For the four largest investor-owned utilities in the state, expenses associated with environmental regulation have caused average customer charges to be from 2 to almost 15 percent higher than without such regulations, depending on the utility. The direct impact on the average residential customer's electric bill was an increase of from $0.81 to $5.20 per month on a January, 1978, bill of roughly $31.00 for 750 kilowatt hours (KWH). In addition, indirect impacts on residential customers would include the higher costs of locally produced goods and services which use electricity. Because of environmental considerations, the four utilities' capital investment increased by more than $400 million during 1975-1977, or 145 percent over the base of $275 million in environmental facilities in 1975.

In a study funded by a Board of Regents STAR grant, the author analyzed 1975-77 cost data for Florida Power & Light, Florida Power Corporation, Gulf Power Company, and Tampa Electric Company. He also formulated rough projections of expenses related to environmental regulation for 1978-80.

Although benefits associated with environmental regulation expenditures were not addressed in the study, there is evidence that current regulatory approaches are not cost-effective.

At some point, the gains from improving the environment are outweighed by the costs: the loss of resources which could have been used for meeting other public and private demands. Data collected on the cost side allow determination of which environmental regulations are having the greatest impacts on customer bills. Such information can assist decision-makers in setting priorities for improving our knowledge of complex human/industrial/environmental relationships.



An assumption implicit in the study was that the assimilative capacity of the environment can, and should, be used so that humans can enjoy more goods and services (including leisure) than would otherwise be possible. If we believed that regardless of the costs no noise should disturb our waking hours and that not one ounce of particulate matter should enter the atmosphere, there would be little reason to keep track of environmental expenditures. However, the question is not whether emissions should be allowed but the amount to be allowed.

The author has established some baseline numbers for the state as a whole to indicate the broad impacts of environmental regulations with the hope that once the scale of current direct costs is known, additional costs imposed by new regulations would be put in perspective. The numbers in the study should be considered very rough in nature and cannot be used to compare expenditures across firms. Different reporting and accounting procedures make it very difficult to develop precise line-by-line comparisons.

Besides bringing the mix and magnitude of environmental expenditures to the attention of customers and policy-makers, there are at least two other byproducts of the data collection effort: consideration of the treatment of property taxes and the range of discretion utilities possess. Under Florida statute, environmental equipment is exempt from property taxes. There are some categories of environmental expenditures which are currently not interpreted as tax-exempt; for example, replacement capacity needed to power environmental equipment is currently taxed. In other instances, the investor-owned utilities will disagree with assessors over whether or not particular items should be exempt. This study should provide a framework which county property tax assessors and utility accountants will find useful.

Another aspect of this study is the heightened awareness of the choices firms can make in the environmental area. Not all costs are mandated. Noise abatement, underground lines and other esthetic expenditures, and research and development involve a range of discretion by firms. Informal meetings between firms and the Public Service Commission can determine whether such expenditures are cost-effective.

Reported environmental facilities expenditures

Growth in environmental facilities in Florida firms occurred primarily between 1975 and 1977-78. The author analyzed data reported by firms in the categories of air pollution control, water pollution control, solid waste disposal, noise abatement, esthetics, additional plant capacity, construction work in progress, site opportunity costs, and miscellaneous expenditures. Adjustments were then made to achieve greater consistency among firms and numerous corrections in reported data were made after interviews indicated that accepted accounting procedures did not provide good estimates of some economic costs.

As Table 1 shows, the more stable categories were noise abatement, esthetic costs, and additional plant capacity, the first two of which involve facilities over which the utilities exercise some choice. Air, water, and solid waste control facilities increased by 386, 223, and 387 percent respectively from 1975 through 1977. Total facilities for Florida grew from $276 million in 1975 to $688 million at the start of 1978.

If we take a particular year, say 1977, *reported* facilities for the four firms amounted to $426 million, while the study estimates that $484 million would be a better estimate of facilities at the beginning of 1977. These *estimates* ranged from 55 to 11 percent higher than the reported facilities (for FPC and Gulf, respectively). Such a correction factor may be an overestimate or underestimate,

Table 1.—Environmental protection facilities: cost estimates for four Florida utilities, 1975, 1976, 1977, 1978

	1975	1976	1977	1978
Air pollution control				
Beginning balance	$ 57,394,938	$ 75,501,534	$ 134,065,604	$ 279,007,462
Additions	18,106,596	58,564,070	145,075,379	6,306,000
Retirements			(133,501)	
Water pollution control				
Beginning balance	57,999,927	60,383,591	141,940,248	187,684,160
Additions	2,383,664	81,556,657	45,797,735	19,823,000
Retirements			(53,825)	
Solid waste disposal				
Beginning balance	3,343,099	3,343,099	12,720,479	16,071,222
Additions	0	9,377,380	3,350,743	444,000
Noise abatement				
Beginning balance	45,238,529	45,812,508	48,944,740	49,852,740
Additions	573,979	3,132,232	908,000	525,000
Esthetic costs				
Beginning balance	49,747,000	68,384,600	77,649,600	82,877,600
Additions	18,637,600	9,265,000	5,228,000	3,127,000
Additional plant capacity				
Beginning balance	10,134,000	10,134,000	14,176,000	16,228,000
Additions	0	4,042,000	2,052,000	886,000
Miscellaneous[1]				
Beginning balance	39,421,699	45,706,699	41,709,631	42,846,793
Additions	1,000,000	213,307	1,138,162	0
Retirements		(4,211,375)		
Site opportunity costs				
Beginning balance	12,500,000	12,700,000	12,900,000	13,100,000
Additions	200,000	200,000	200,000	200,000
TOTAL				
Beginning balance	$ 275,779,192	$ 321,966,031	$ 484,105,302	$ 687,667,997
Net additions	40,901,839	166,350,646	203,750,019	31,311,000
Retirements		(4,211,375)		0
Depreciable electric plant				
Beginning balance	$4,504,674,576	$4,769,648,820	$5,893,288,468	$6,676,549,507
Net additions	213,928,844	1,030,720,648	361,421,039	78,213,316
Total electric plant				
Beginning balance	5,124,209,778	5,491,258,504	6,523,769,115	6,971,227,114
Net additions	367,048,726	1,032,510,611	447,467,999	85,188,000[2]
Revenues from electric sales				
Residential	936,376,963	976,682,406	1,177,350,609	
Commercial	591,974,025	639,727,797	766,187,016	
Industrial	215,461,285	238,952,858	284,917,950	
Other[3]	162,033,561	178,669,842	213,553,241	
Total	$1,933,845,834	$2,034,032,903	$2,442,008,815	
Sales (KWH)	61,033,765	63,158,281	67,926,584	

[1] Includes costs for radiation containment structures and spent fuel pit for FP&L.

[2] FPC and FP&L not reporting.

[3] For FPC and FP&L includes street lighting, sales to public authorities, sales for resale; Gulf Power has no "other" category.

but it at least serves as an example of how a more comprehensive index could be calculated.

Air pollution control is governed by the Clean Air Act of 1970 and later amendments. The main air pollutants are sulfur dioxide (SO_2) and total suspended particulates (TSP). For Florida in 1975, air pollution control was estimated to be $57.3 million of the $279.8 million investment in environmental protection facilities of the four investor-owned utilities. With the Crystal River nuclear plant coming online by 1978, the estimate increased to $279 million of a total $688 million for all four utilities. For comparison purposes, future reports should introduce a separate category, nuclear radiation control.

Water pollution control has been a major environmental expense for all Florida firms, with water temperature being the major area for electric utility investment for the avoidance of pollution.

Solid waste disposal costs grew more during the study period than any other category except nuclear facilities, growing from $3.3 million estimated for the four utilities at the beginning of 1976 to almost $16.1 million by the beginning of 1978.

Noise abatement equipment was not reported by two of the Florida firms, TECO and Gulf Power, as of 1977, yet the costs turned out to be considerable. Even if not required, however, such equipment might be installed by firms to avoid complaints from neighbors. A "buzz" associated with a transformer which might be perfectly acceptable in a rural (low population density) area would not be appropriate in an urban setting. A more than tenfold difference reported in noise abatement costs for FP&L and FPC may be partially explained by such location differences.

Esthetic costs are categorized quite differently across firms, with Tampa and Gulf reporting none at all in their 1977 reports and FPC reporting a minor amount at the start of 1978. The estimates shown in Table 1 include estimates for these firms. Such costs might include architectural expenses, portions of towers, underground lines, and landscaping. Some cities place strict requirements on transmission, substation and distribution facilities. FP&L attributes some of its underground system to this category.

Additional plant capacity is that capacity necessary to power fans, pumps, and other devices associated with environmental control facilities. Obtaining reasonable estimates in this category is a complicated process and firms have very different reporting patterns. In the future, engineers from the various utilities might wish to meet and discuss procedures so that at least the estimates would be comparable.

The *miscellaneous* environmental facilities category is a useful catchall to ensure that some costs are not missed. Specifically, it includes the costs of preparation of environmental reports, fish and wildlife areas, and parks and related facilities.

Construction work in progress reflects environmental investments which have not yet gone online. This category may involve many environmental studies and a long time lag; current accounting procedures provided some discretion as to whether firms should put the costs into the rate base before a unit goes online. If a firm does not include these investments in the rate base as they are incurred, future customers, for whom the new facility is built, pay for the facility. Since environmental facilities are required because of current commitment to pollution control, however, the Federal Energy Regulation Commission in 1976 adopted new principles which have tended to be adopted by state regulators to include the costs in the rate base for current customers.

Site opportunity costs involve a number of complex tradeoffs. For example, to avoid fuel transportation costs, a firm might locate near a population center, thus incurring costs for noise abatement and tighter air pollution controls which would then be counted as environment-related costs. If located in a rural area, a plant would incur no direct environment protection costs, yet clearly the fuel transportation and other costs to customers would be borne by those customers. Much more attention should be given to the problem of site opportunity costs, since it affects meaningful comparisons among firms.

Comparisons with other southern states

Florida firms report relatively more investment in environmental facilities than utilities in other southern states, as Table 2 shows. Relatively rapid growth rates in electricity demand have been a major cause of this development, since recent federal standards are applicable to a relatively larger proportion of the total electric plant. Furthermore, in some areas such as Dade County, local standards are more stringent than federal standards. However, even if the reported numbers were "correct," we can conclude nothing about the cost-effectiveness of these expenditures. For example, Duke Power Company is slightly larger than FP&L but reports its investment in environmental facilities as less than half FP&L's. One cannot conclude that FP&L achieves twice the environmental benefits of Duke Power, nor can one determine from these numbers alone whether its total is too high or too low.

Not only are the totals crude, but even the individual components provide little information. Rather, the reporting patterns provide some insight into how these numbers emerge as byproducts of other activities. A quick scan of the gaps in the tables and of particular

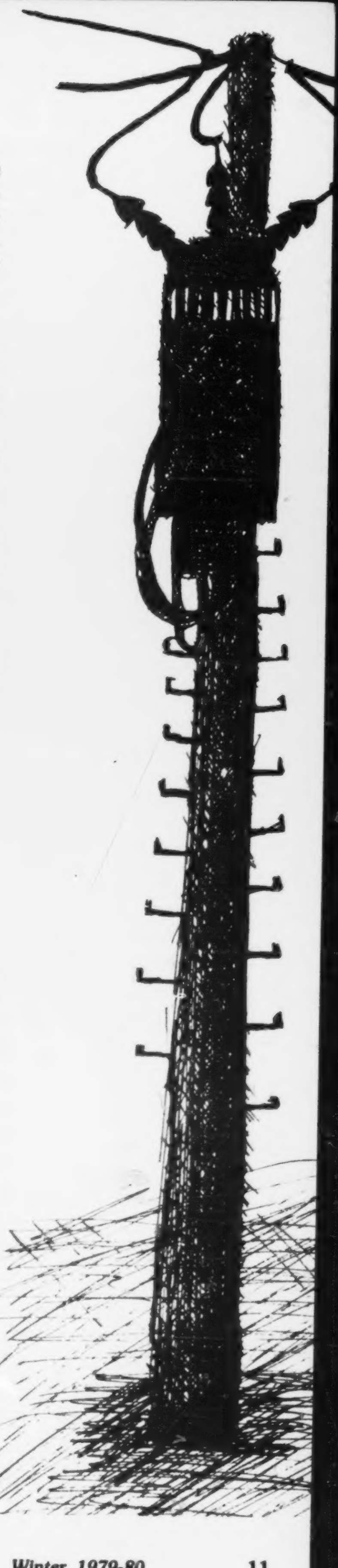


Table 2.—Environmental protection facilities: reported costs for fifteen southern utilities, 1977

	Alabama Power Company	Arkansas-Missouri Power Company	Arkansas Power and Light Company	Carolina Power and Light Company	Duke Power Company	Georgia Power Company
Air pollution control facilities	$115,630,165		$ 13,724,779	$ 61,987,027	$ 76,713,761	$ 82,903,246
Water pollution control facilities	581,077	$ 347,306	3,357,011	80,997,182	6,941,182	46,502,458
Solid waste disposal costs	12,007,941			11,858,880	14,890,341	44,812,309
Noise abatement equipment	81,393		35,732	974,088	3,934,000	
Esthetic costs	27,800,705		8,804,957	23,423,268	8,570,888	62,649,000
Additional plant capacity	3,043,341		1,290,000	5,232,770	3,246,300	37,929
Miscellaneous	455,447		459,017	5,120,667	1,400,023	2,062,000
TOTAL	$159,600,069		$ 27,671,496	$189,594,099	$115,696,495	$238,966,942
Total electric plant ($000)	3,898,457	105,338	1,762,815	2,912,235	5,299,874	4,331,247
Total depreciable plant ($000)	3,287,514	71,043	1,465,351	2,496,798	4,231,771	3,553,133
KWH produced (1977) (000)	24,770,218	1,682,534[1]	12,643,435	28,630,514	52,346,916	43,457,581
Percent total plant	4.09	0.33	1.57	6.51	2.18	5.52
Percent total depreciable plant	4.86	0.49	1.89	7.59	2.73	6.73

	Louisiana Power and Light Company	New Orleans Public Service Incorporated	Texas Power and Light Company	Mississippi Power and Light Company[1]	Virginia Electric and Power Company[2]
Air pollution control facilities	$ 3,182,378	$ 28,418	$ 4,278,645	$ 4,903,089	$102,574,000
Water pollution control facilities	1,481,441	0	1,250,707	4,756,473	53,841,000
Solid waste disposal costs		0	7,153,259		13,459,000
Noise abatement equipment	806,917	58,000	160,585		930,000
Esthetic costs	9,981,400	3,313,970	826,886		17,432,000
Additional plant capacity		0	1,536,574		
Miscellaneous	1,107,520		297,451		
TOTAL	$ 16,559,656	$ 3,400,388	$ 15,504,107	$ 9,659,562	$188,236,000
Total electric plant ($000)	1,509,785	380,284	2,078,257	678,219	4,600,069
Total depreciable plant ($000)	1,229,426	234,007	1,752,481	521,623	3,909,162
KWH produced (000)	20,203,877	3,586,976	22,719,340	10,544,502	36,953,884
Percent total plant	1.10	0.894	0.75	1.42	4.09
Percent total depreciable plant	1.35	1.45	0.89	1.85	4.81

	Gulf Power Company	Florida Power and Light Company	Tampa Electric Company	Florida Power Corporation	Total for Florida
Air pollution control facilities	$ 42,487,503	$ 17,721,000	$ 68,092,811	$ 5,578,899	$233,880,213
Water pollution control facilities	14,239,240	108,670,000	22,459,763	9,339,361	154,708,364
Solid waste disposal costs	71,985	6,501,000	84,127	3,422,515	10,079,627
Noise abatement equipment		41,334,000		282,408	41,616,408
Esthetic costs		67,447,000		53,096	67,500,096
Additional plant capacity		1,680,000	9,912,000	0	11,592,000
Miscellaneous		6,445,000			6,445,000
TOTAL	56,798,728	249,798,000	100,548,701	18,676,239	425,821,668
Total electric plant ($000)	611,057	4,515,324	908,112	1,822,996	7,857,489
Total depreciable plant ($000)	483,107	3,773,462	743,936	1,515,606	6,516,111
KWH produced (000)	5,907,373	41,176,515	10,338,448	15,935,000[1]	73,357,336
Percent total plant	9.30	5.53	11.07	1.03	5.42
Percent total depreciable plant	11.76	6.62	13.52	1.23	6.54

[1] Total MKWH sold in 1977.

[2] 1976 data.

Sources: Federal Power Commission Form No. 1 Reports, pp. 501-502; Financial Statistics of Public Utilities, C. A. Turner and Associates, Inc., Illinois, 1978; Moody's Public Utility Manual, Moody's Investors Service, Inc., New York, 1978.

numbers indicates that the large sample of firms has the same divergent treatments of various components as did the four-firm Florida sample of *reported* investments. Noise-abatement and esthetic costs receive differential attention across firms, as does the category of additional plant capacity.

Environmental expenses

Compliance with environmental regulations can sometimes be achieved through an increase in current expenses, so this area is treated separately from capital expenditures for pollution control facilities described above. In some instances, annual *expenses* such as payments for relatively expensive low-sulfur fuel (containing a relatively low proportion of pollutants) can substitute for capital investments in pollution control facilities. Firms take such interrelationships into account when determining least-cost expansion paths.

Depreciation was accounted for differently across firms. TECO and Gulf Power applied current depreciation rates to pollution control equipment. Beginning in 1976, FP&L based its depreciation computation on the actual period pollution control units were in operation. This expense category is a significant one for the state, as can be seen from Table 3.

Labor, maintenance and materials is not a large category, totaling about $5.5 million for the four Florida firms in 1977. Comparability across firms is difficult because the same services might be allocated to administrative and general accounts.

Fuel-related costs, primarily the difference in the cost of cleaner fuels, depends on the available generation mix. For example, FP&L nearly halved its costs between 1976 and 1977 by burning less low-sulfur fuel for three reasons: some units reverted to higher sulfur fuel until benefits associated with regulations tighter than federal standards could be documented; more nuclear capacity was available; and the price differential between low- and high-sulfur fuels narrowed as relative demands shifted.

Replacement power costs stem largely from efficiency lost through the use of environmentally preferable fuels.

Taxes and fees account for a small proportion of environmental expenses.

Administrative and general costs are handled very differently by different firms and the 1977 reported figures range from $1.5 million for FP&L to $90,000 for FPC.

Research and development is another grey area in firms' reports of environmental expenses. The cost of environmental reports for plant siting purposes can be capitalized into the cost of the plant, and FP&L has followed this procedure. Other firms may be including such expenditures under expenses rather than facilities, especially when engineering design is de-emphasized and more general principles are involved.

Return to capital is not included as a separate category in reported environmental protection expenses. The omission of this cost is incredible but understandable, given the difficulties of comparing firms. Gulf Power lists no additional capacity, but calculates replacement power. Those replacement power purchases include some return on investment. Yet a firm which invests in additional capacity itself only reports depreciation of that investment without provision for a return to capital. In this study, total plant, rather than depreciable plant, was used for calculating both depreciation and return to capital, so this number could be a slight overestimate.

Miscellaneous and *site opportunity costs expenses* represent rough estimates.

Expenses comparison

Across the South, reported environmental protection expenses in 1977 ranged from FP&L's $45.2 million (with Georgia Power Company's $44.5 million a close second) to Arkansas-Missouri Power Company's $21,775. Here, the omissions and further comparisons reveal vast accounting differences. Georgia Power lumps $5.7 million into administrative and general, compared with Duke Power's $74,240 and FP&L's $1.5 million. Similarly, Georgia Power reports $5 million in taxes and fees (while FP&L reported $8,000). There were other classification differences. Over half of Alabama Power Company's expenses were due to cost of capital applied to construction work in progress. No other firm introduced these costs. Most firms appear to ignore research and development costs. Thus, the environmental expense estimates for the four

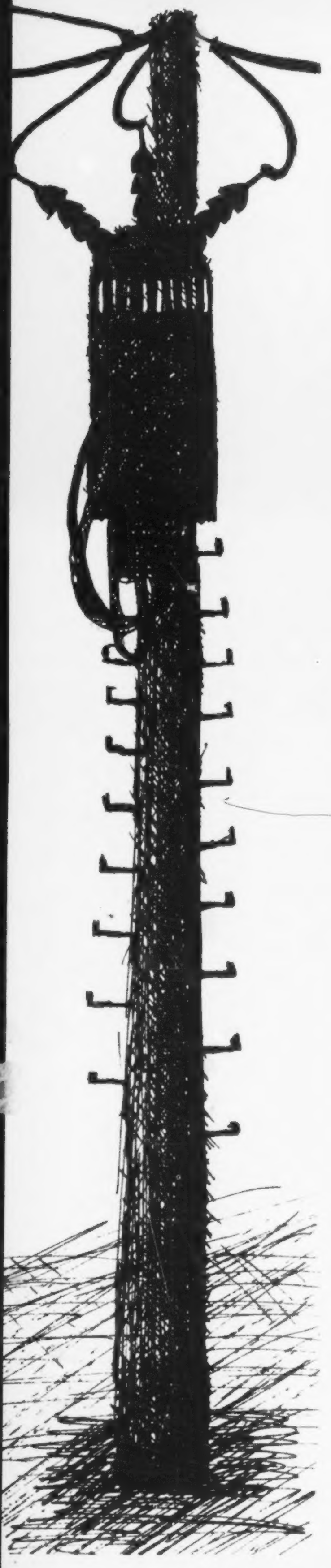


Table 3.—Environmental protection expenses: cost estimates for four Florida utilities, 1975, 1976, 1977

	1975	1976	1977
Depreciation	$ 10,940,439	$ 14,759,100	$ 23,485,727
Labor maintenance materials and supplies	4,729,780	5,681,450	5,482,426
Fuel-related costs			
Operation of facilities	165,390	825,910	3,234,152
Fly ash and surplus sludge	1,078,840	1,378,640	1,675,404
Difference in cost of removal of cleaner fuels	58,700,000	63,611,000	51,213,000
Replacement power	4,429,250	13,323,200	13,076,500
Taxes and fees	2,731,094	3,018,005	3,379,103
Administrative and general	2,381,108	3,032,070	2,088,522
Research and development	1,757,470	2,298,479	2,543,550
Return to capital	26,098,441	35,179,702	51,073,540
Site opportunity cost expenses	1,100,000	1,100,000	1,100,000
TOTAL	$114,111,812	$144,198,556	$158,369,933

Florida firms must be viewed in the context of rough reported numbers.

Table 3 shows the yearly expenses for Florida utilities, including the return to capital. In 1977, the return was about one-third of total expenses, or $51 million, indicating that this component represents a sizable cost to customers. Since customers ultimately pay for the financial capital necessitated by investments in facilities, the addition of this category seemed reasonable.

However, even excluding the cost of capital, the estimates of expenses are still greater than those reported (in 1977 the estimate is $107.3 million vs. $97.4 million reported for the four firms). Depreciation on the estimated facilities is part of the reason for the difference, but replacement power and taxes are two other items that were augmented by taking a more detailed look at the reported numbers. Note that the increased taxes are not social costs. Rather, these expenses represent transfers to those economic entities (firms and individuals) whose property tax liabilities are reduced by utility payments. Thus, the tax component of the customer bill does not represent a drain on society's resources but only a transfer from one group to another. The other costs reflect resource reallocations away from the production of other goods and services and toward the production of environmental amenities.

Costs to customers

Environmental expenditures translate into higher bills to customers. Given the level of aggregation, precise impacts on customer groups would be impossible to compute. However, the cost can be expressed in terms of a percentage of revenue from customers. Presumably, without the expenses, revenue requirements would fall by comparable amounts. Depending on the rate structure (and relative contributions of various customer categories to capital), a proportion of the cost per KWH would be borne by the various customer classes.

Environmental expenses varied widely as a proportion of electricity revenue. This ratio serves as a gauge of the importance of such expenses as a determinant of revenue requirements. The proportion increased for all four investor-owned utilities from 1975 through 1977, with FPC experiencing a big jump in this ratio, due to Crystal River coming online. This study estimated increased electricity bills due to environmental expenditures—assuming the proportionality factor is applied to the given rate structure. In January, 1978, for 750 KWH, a FP&L customer would pay $1.50 more per month ($18.00 per year) while a TECO customer would pay $5.20 more per month ($62.40 per year), given our assumptions. Presumably there are substantial benefits associated with these per-customer expenditure levels, although these benefits may accrue to groups which do not foot the bills (which raises thorny equity issues).

It needs to be emphasized that from the standpoint of economic efficiency, prices ought to reflect social costs. Environmental expenditures are undertaken to reduce negative externalities (such as pollution) imposed on others. These social costs need to be included in the price so consumers can make wise decisions. Otherwise their choice to consume another KWH will be based on perceived benefits of electricity, but not the social costs of making it available.

It also should be noted that the residential customer bill is only one part of the cost borne by citizens. The higher cost of electricity to commercial entities and governments will be directly reflected in prices of services such groups produce for local consumption. Similarly, industrial products will have higher prices. Thus, any complete accounting of cost impacts should take such changes into account.

Cost-effectiveness of environmental regulation

The focus of this study has *not* been on the cost-effectiveness of environmental regulation. We have not evaluated alternative techniques for achieving the same level of benefits. Nevertheless, anecdotal evidence and economic theory both suggest that current procedures (mandated standards) are not cost-effective. There is still much discussion about the best ways to reduce pollution and to determine appropriate levels of noise, SO_2, and other "bads". We do know, however, that reducing these "bads" takes resources, which reduce the goods (and services) available for consumption and investment. Mandating some permissable level of emissions is likely to be inefficient, in that those producers who can further cut back the production of "bads" at low additional cost are not encouraged to do so. Other producers with high compliance costs may be overinvesting in abatement. Agencies should consider the use of economic incentives in this area, including a tax on emissions. Establishing the tax that will yield the appropriate level of ambient air quality, for example, is no easy task. However, the information requirements are much less than in the standards-setting case since, to achieve efficiency, the regulatory agency has to know the production functions of all current and potential polluters. Either taxes or markets for pollution rights would be steps toward better use of the price system.

Recommendations

At least once a year, utilities should notify customers in their monthly bills of the impact of environmental expenditures on their bills.

Utilities should establish internal, interdepartmental committees to estimate environmental costs.

When deriving total air pollution control facilities, firms should footnote the separable cost of nuclear radiation containment structures, in anticipation of when the Federal Power Commission (Federal Energy Regulatory Commission) reporting Form No. 1 is revised to include such items.

Representatives from environmental cost committees should meet periodically with Public Service Commission staff to discuss procedures used to determine various components.

The Federal Energy Regulatory Commission should devote resources to improving the quality of information presented in Form No. 1.

The Public Service Commission should establish formal staff contacts with the Department of Environmental Regulation, with the cost-effectiveness of regulations given substantial attention.

Limitations of the study

The extent to which this study has successfully estimated environmental expenditure patterns for Florida utilities can be credited to the assistance of utilities around the state. Even though the estimates are partial, tentative, and aggregated, they provide a baseline for future cost studies. We need more comprehensive studies in this area. In particular, the most glaring limitations of an exercise which focuses on costs is the absence of estimates of associated benefits.

FIGURING THE COST OF CLEANER AIR FOR EIGHT FLORIDA COUNTIES

This article is condensed from an Economic Impact Assessment Statement released by the Florida Department of Environmental Regulation.

The 1977 amendments to the Federal Clean Air Act required states not in compliance with the National Ambient Air Quality Standards to submit revised state implementation plans by January, 1979. These revised plans must demonstrate attainment of these quality standards by 1982.

The Region IV administrator of the U.S. Environmental Protection Agency (EPA) has designated eight Florida counties as nonattainment areas: Broward, Dade, Duval, Escambia, Hillsborough, Orange, Palm Beach, and Pinellas. Though few in number, these eight counties contain almost two-thirds of Florida's population.

The Clean Air Act amendments require that the state implementation plans ensure "interim reasonable further progress" toward attainment, which is defined as (among other considerations) the application of "reasonably available control technology" to restrict air emissions of certain organic compounds and oxidants.

The State of Florida is currently preparing its revised state implementation plan. However, Florida law requires that the economic impact of all proposed regulations be established before they may be adopted by the state legislature. Each proposed regulation must be accompanied by an economic support document which reports: (1) the cost to public agencies for implementing and enforcing the law, (2) the costs and benefits to all directly affected persons, (3) an analysis of the proposed law's impact on competition and employment, and (4) a statement of methodology for determining the above three requirements.

A preliminary report has been prepared to assess the impacts on the eight nonattainment counties of the proposed state regulations. Figures quoted below illustrate the scope of the cost-benefit impacts involved.

Two comprehensive inventories of emissions in nonattainment counties were conducted by Pacific Environmental Services (PES) for the state. The firm did the cost-benefit analysis with figures furnished by the state.

The cost to public agencies

Florida agency costs estimated by the Florida Department of Environmental Regulation's Bureau of Air Quality included the addition of a staff meteorologist ($1,338-$1,807/month) and environmental specialist IV ($1,338-$1,807/month) for each county. In PES' subsequent calculations for Hillsborough and Pinellas counties, two persons were assumed to be required in each position. Support positions (secretarial and clerical) and fringe benefits would bring the total cost of each new staff addition to approximately $20,000 per year. Thus, total administrative costs of the regulations were calculated to be $320,000 per year.

Costs and benefits to directly affected persons

The costs of controls and the benefits of emission reduction were computed separately

Table 1.—Summary of annual costs and benefits of air pollution control technology in nonattainment counties

	Control costs[1]				Admin-trative costs (1978 $)	Annual control & adminis-trative costs[2] (1978 $)	Material damage prevented (1978 $)	Population protected from high oxidant exposures (July 1, 1978, estimate)[3]
	Point (1976 $)	Area (1976 $)	Total (1976 $)	Total (1978 $)				
Broward	215,000	(164,300)	50,700	59,700	40,000	99,700	667,000	929,584
Dade	10,000	(267,700)	(257,600)	(303,200)	40,000	(263,200)	416,500	1,494,276
Duval	141,000	(117,600)	23,400	27,500	40,000	67,500	666,100	574,004
Escambia	(10,000)	(44,500)	(54,500)	(64,100)	40,000	(24,100)	NA	231,133
Hillsborough	633,000	(162,400)	470,600	554,000	40,000	594,000	1,083,100	615,844
Orange	82,000	(92,900)	(10,900)	(12,800)	40,000	27,200	187,000	430,680
Palm Beach	---	(84,100)	(84,100)	(99,000)	40,000	(59,000)	105,000	534,551
Pinellas	---	(144,300)	(144,300)	(169,900)	40,000	(129,000)	533,000	708,068
TOTAL	1,071,000	(1,077,700)	(6,700)	(7,800)	320,000	312,200	3,657,700	5,518,140

NA Not available.

[1] Parentheses indicate net savings.

[2] Does not include costs for nonreporting sources.

[3] Source: University of Florida, Bureau of Economic and Business Research, Division of Population Studies, Florida Estimates of Population, July 1, 1978.

for point and area sources of emissions following EPA guidelines for establishing "reasonably available control technology" for certain industries.

Annualized point-source costs totaled $1,071,000 in constant 1976 dollars (see Table 1). In many instances, implementation costs include a credit for fuel or solvent which is recovered, and in some cases the net effect is a credit.

Area-source implementation costs are more than offset by these credits. Implementation of the required control technology was estimated to produce an annualized area-source net savings of $1,077,700 (see Table 1).

The total estimated cost for nonreporting sources was $3,792,000. However, it is important to note that this is an estimate of maximum potential control expenditures.

A reduction in organic compound emissions would lead to concomitant reductions in air pollution damages to health, esthetics, and psychic well-being. Economic costs of air-pollutant emissions include: (1) decreases in horticultural, agricultural, and forest production; (2) hospital, doctor, and medical expenses; (3) reduced useful life of materials, machinery, equipment, and buildings; (4) reduced productivity of persons and materials; (5) soiling costs; (6) value of lost activity; (7) reduced value of property.

The best estimate of these economic damages is $1.1 billion per year nationally (in 1976 dollars), an average of approximately $5.90 per capita. This includes only damage to materials and vegetation. Oxidant-related economic damages from impaired esthetics, soiling, health problems, and animal injury have not yet been quantified. The eight nonattainment areas in Florida incur approximately $32 million annually in economic damages (see Table 2). Installation of the control technology would save approximately one-tenth of this amount annually.

In addition to economic damages, certain psychic damage has been documented. Psychic costs of air-pollutant emissions include: (1) mental discomfort people feel because they perceive air pollution as a threat to human life; (2) mental discomfort people feel because loved ones are ill more often or die prematurely; (3) the discomforts such as shortness of breath and physical weakness resulting from direct exposure to the pollutants; (4) reduced sunlight, restricted visibility, and increased discoloration of buildings; (5) mental discomfort people feel because they believe nature is being assaulted.

The control of organic compound and oxidant emissions would reduce these adverse psychic and health effects. The benefits are important, although unquantifiable.

Table 2.—Annual material damage prevented by application of air pollution control technology in nonattainment counties

	Total VOC (volatile organic compounds) emissions 1977	VOC emissions reduction (tons/year) by 1982	Percent reduction	Material damage total	Material damage prevented
Broward	72,976	7,666	10.5	$ 5,397,574	$ 566,745
Dade	101,383	4,176	4.1	8,629,570	353,812
Duval	65,544	10,768	16.4	3,450,479	565,879
Escambia	NA	220	NA	1,347,165	NA
Hillsborough	44,873	11,266	25.1	3,665,965	920,157
Orange	39,728	2,495	6.3	2,523,371	158,972
Palm Beach	52,610	1,557	3.0	2,974,385	89,232
Pinellas	30,277	3,382	11.2	4,042,680	452,780
TOTAL	407,391	41,530		$32,031,189	$3,107,577

NA Not available.
Source: Pacific Environmental Services.

A major concern of environmental policymakers has been whether government-mandated pollution expenditures will promote industry concentration, or the domination of an industry by one firm (monopoly) or a few firms (oligopoly). As the implementation of control technology regulations forces marginal firms to close, the probability of industry concentration increases.

Neither a monopolistic nor an oligopolistic economy is desirable, as both allow the producer to control prices. In a competitive situation, prices are established when supply and demand are allowed to reach market equilibrium through unrestrained interaction. In a monopolistic or oligopolistic environment, producers manipulate demand by withholding supply, thus driving prices upward and promoting inefficient resource allocation.

Major econometric models have attempted to predict the impact of air pollution regulations. In 1972, Chase Econometric Associates, using an elaborate input-output model, predicted that the Clean Air Act would require industry expenditures of $26 billion and would result in 12,000 plant closures. Of these, 800 would have closed in the normal course of business between 1972 and 1976. However, Chase Econometrics concluded that while the effects of these expenditures will be measurable, they will not "seriously threaten the long-run economic viability of the industries examined."

Florida policymakers will have to determine the likelihood of closure on a case-by-case basis. Control technology expenditures should pose a serious threat to only a few firms.

Another possibility which merits further discussion by Florida policymakers is the undue competitive advantage which may be afforded to firms located outside nonattainment areas, where the emissions limits may not apply. PES does not have industry data for attainment areas and thus has not calculated this impact.

These regulations do confer considerable discretion to air pollution authorities in considering variances and alternative compliance schedules to ameliorate technological or economic hardship. Thus, many potentially adverse impacts may be mitigated.

When firms close, some unquantifiable increase in unemployment will occur. In firms which do not close but are compelled to invest substantial sums in control technology, unemployment may be an indirect impact. For example, if the cost of the required technology is passed to the consumer in the form of higher prices, demand for the product could decline and unemployment would then result.

The discretionary powers involved in granting variances and alternative compliance schedules may also be used to offset employment impacts.

Finally, positive employment impacts will occur in those Florida industries which supply control technology equipment to affected industries.

TAMPA AS A TEST AREA:

measuring the benefits of air quality regulation

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and

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Air pollution affects people and property; it detracts from the quality of life we receive from the environment. Considerable resources are being devoted to the improvement of air quality in Florida. Considerable progress has been made in measuring the costs of determination of air quality and enforcing air quality standards.

The Florida Department of Environmental Regulation (DER) is charged with the responsibility of developing and enforcing air quality regulations in the state. DER is required to analyze the economic consequences of its actions. It is important that we attempt to measure the benefits of air quality regulation to see if these efforts are worthwhile and to see whether they should be continued at present or increased levels.

The purpose of this study is to aid the Florida Department of Environmental Regulation in analyzing the economic impact of its regulatory actions with regard to air pollution abatement. Specifically, we have tested and applied alternative measures of benefits of air quality improvement in a Florida setting.

We have concentrated on benefit measures involving existing data and have not engaged in collection of costly new data. We have used low-cost procedures which might be employed by DER personnel. Special attention has been given to property value measures and to measures of health effects. In addition, we have analyzed exposure to air pollution at the census tract level by socioeconomic characteristics. We have used the City of Tampa, comprised of seventy-three census tracts, as a test area.

The scientific literature contains only one comprehensive study of benefits for air pollution abatement in Florida.[1] With some exceptions, Florida has good air quality. With the low level of pollutants measured, we would not expect to find significant damage and the detection of damages may be more difficult. It is possible, therefore, that benefit measures

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[1] Florida Sulfur Oxides Study, Inc. (1978). *Final Report*, prepared for Florida Environmental Regulation Commission, Tallahassee, Florida.

employed in other areas may not be feasible in Florida.

Existing benefit studies are flawed

A review of benefit measures of air pollution abatement discloses three major problems which affect their accuracy and acceptability. First, most studies which use field data have been plagued by measurement errors across pollutants, across locations, and across time periods. Sampling errors vary with instrumentation used and vary greatly in the translation of emission data into ambient quality. Diffusion models to "distribute" air quality across space are employed to make up for the paucity of metering stations. Yet, the validation of diffusion models is rare. Moreover, damage estimates are often based upon readings from a city's dirtiest stations. The common assumption is that the city as a whole faces levels of pollution found at the dirtiest stations when the problem may be confined to a small area. There is a real need for more accurate ambient data on air quality within urban areas. For Florida, the problem is intensified to some extent because instrumentation is generally less accurate when low-level concentrations are measured.

Second, it is clear that the range of uncertainty about dose-response functions is very large. This means that the estimates of damages from air pollution are quite uncertain. Actual exposures (cumulative versus episodic) to pollution are seldom known. Extrapolation from laboratory studies to real-world populations is fraught with difficulties. Epidemiological studies have many measurement problems, and medical experts disagree on the possible existence of thresholds and factors of safety.

In regard to Florida, these matters of uncertainty about dose-response functions are even greater because there is much more uncertainty about possible damages from low-level concentrations. Not only are these low-level concentrations more difficult to measure, but there is also more room for doubt about the damages which might be inflicted.

Third, the translation of physical damages into monetary measures is also subject to error and criticism. Economists have used damages-averted, market-value approaches, and survey approaches. Each approach has strengths and weaknesses. The property-value approaches and the health-damage approaches have been employed most frequently. Health-damage approaches suffer from poor dose-response data and from disagreement on methodology to value willingness to pay for longevity versus productivity benefits foregone. The property-value approach can only show benefits to the extent that households perceive differences in air quality and perceive their effects. The degree of possible overlap between property-value studies and health-damage studies is unknown. Moreover, the property-value approach must employ a properly specified hedonic price function approach.[2] Only three of the existing eighteen property value studies have used the hedonic price approach.

From the standpoint of the Department of Environmental Regulation, use of the property-value approach would require the services of a highly trained economist using a rich data set. The data could be acquired with large funds available for original data collection or the study could be done at a reasonable cost with 1980 census data when available in 1982 or 1983. However, if it cannot be shown that property values are negatively related to air pollution in some simple property value regressions, use of the sophisticated hedonic price approach would not be justified. The health-damage approach will be of limited use in Florida until better dose-response functions are formulated for the low-level concentrations of air pollutants observed in Florida.

Ambiguities and problems

Our study of air quality in Tampa increased our awareness of ambiguities and problems in the use of air quality data taken from field data. None of the economic studies we have reviewed pointed out to the reader that the air quality data being employed might be subject to fairly large degrees of error. There is every reason to believe that the Hillsborough County Environmental Commission operates a top-notch air quality regulatory program. The commission's annual budget for air quality management is in excess of $500,000. The commission's reports are among the most complete we have seen. Yet, we do not have complete confidence in the air quality reading used in this study.

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[2] In hedonic price functions, housing is viewed as a bundle of attributes rather than a single commodity. By this method, households' willingness to pay for an improvement in air quality can be calculated.

Four kinds of problems are apparent in the use of Hillsborough County air quality data. First is the question of the number and location of sampling stations for ambient quality. By 1977, Hillsborough County had 87 stations, giving it among the best general coverage for a city of its size in the United States. Yet there were only three sampling stations for ozone, one for carbon monoxide, and one for hydrocarbons. In the early years of the program, the number of stations was substantially less.

It is necessary to rely upon diffusion models to estimate air quality over the area as a whole because of the limited number of sampling stations. Use of diffusion models is a second source of difficulty. The Hillsborough County Commission uses the SYMAP system to map county-wide sulfur dioxide, particulate, and nitrogen oxide data. In this study, data for pollution concentrations at the census tract level are based upon the SYMAP system. Nowhere in the Hillsborough commission reports are the limitations of the SYMAP system discussed.

The SYMAP mapping system is a simple linear approximation based upon the assumption that increases in emissions cause proportional increases in concentrations, and that concentrations decrease proportionately with distance from sources. We were disturbed to learn that this system has not been validated. Meteorological and surface roughness factors are rarely ignored. Different pollutants are treated similarly. Yet, this type of linear model is widely used in the United States and is thought to be satisfactory for rough approximation.

A third problem arises because several agencies may actually operate the stations and report readings. We are not sure that multiple management of sampling stations insures common conventions with respect to operation, maintenance and reporting. Minor variations in repair and operation of instruments can cause wide differences in readings. In Hillsborough County, for example, sampling stations are operated by the Tampa Electric Company and by the Florida Steel Corporation as well as by the Environmental Commission. The extent of the problem in this county is unknown.

The fourth problem concerns variations in instrumentation and in sampling practices. For each major pollutant as many as five or six kinds of instruments may be approved by EPA. All have different strengths and weaknesses. Most instruments are subject to more sampling error at low-level readings. Different instruments at the same location can give wide differences in readings for the same pollutant. Sulfur dioxide (SO_2) readings for the Davis Island location for 1973 showed a high of 16 parts per billion (ppb) by the Federal Reference Method and 31 parts per billion by the continuous bubbler method. With the federal standard at 30 ppb and the state standard at 20 ppb, this discrepancy is so large as to make inferences about SO_2 in 1973 data very tenuous. Even more troublesome is the fact that the annual commission reports on air quality do not adequately warn the reader that these kinds of discrepancy exist.

A review of air quality in Tampa leads to three general conclusions. First, the general level of air quality in Tampa is good compared to the national scene. Relative to Florida cities, however, Tampa has dirty air. In 1977, Tampa exceeded state standards for total suspended particulates (TSP) at four sampling stations. The state standard for ozone (80 parts per billion) was equaled or exceeded during forty-eight days in 1977. Other measures of air pollution were below federal and state standards.

Second, the trend in air quality for the years 1970 to 1977 has been one of substantial improvement. The dirtiest metering stations showed readings for both TSP and sulfur dioxide above federal standards in the 1970-72 period. By 1976-77, readings at the dirtiest SO_2 stations were substantially below the state standard and TSP was slightly above state standards at four locations.

Third, air quality varies a great deal across census tracts. Using the SYMAP method described previously, ambient air quality values for all the census tracts in the City of Tampa were calculated and mapped.

Figure 1 illustrates the distribution of TSP for 1970. The darkest symbol on the map depicts those census tracts which exceed the federal primary standard of 75.00 micrograms per cubic meter (ug/m^3). The next darkest symbol indicates tracts with annual average TSP values greater than the state primary and federal secondary standard of 60.00 ug/m³ but less than the federal primary standard. The other two symbols show those tracts having TSP values in the acceptable ranges, between 59.99 and 48.00 ug/m³ and below 48.00 ug/m³. It can be seen that twenty-two out of seventy-three tracts exceeded the federal standard, forty-two had readings between the state and federal primary standards, and only nine tracts had readings in the acceptable range.

Figure 2 shows TSP distributions for 1973. The number of tracts in which air quality exceeded the federal standard dropped from twenty-two in 1970 to only five in 1973, while the number exceeding the state standard dropped from forty-two in 1970 to thirty-nine in 1973. The number of tracts with acceptable air quality increased dramatically from only nine in 1970 to twenty-nine in 1973.

Figure 3 illustrates the distribution for 1976. The number of tracts exceeding the federal standard increased by one over 1973; however, the number of tracts exceeding the state primary standard dropped from thirty-nine in 1973 to fourteen in 1976. The number of tracts with acceptable air quality increased from twenty-nine in 1973 to fifty-three in 1976.

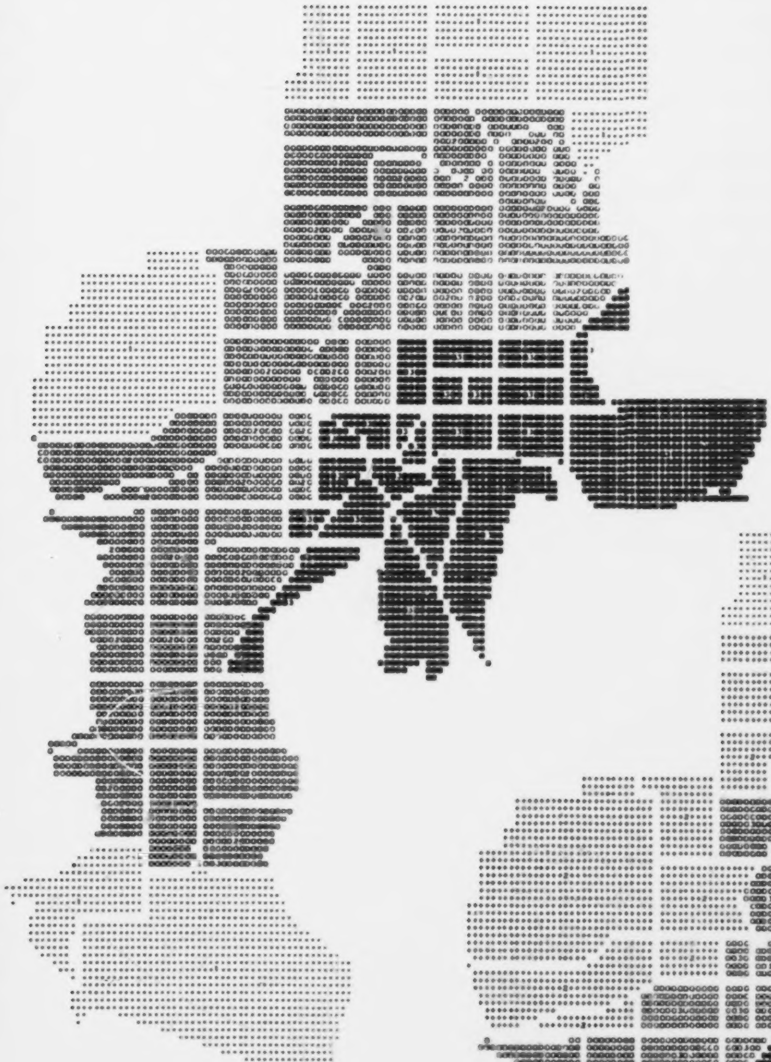

Figure 1.–1970

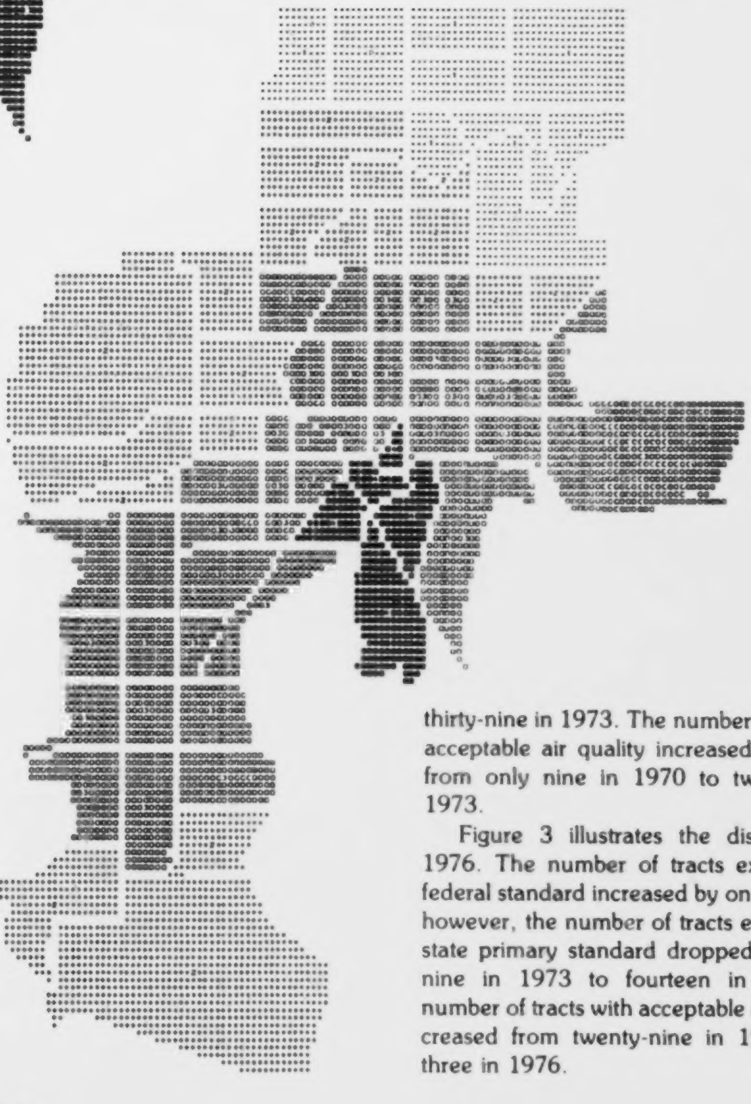

Figure 2.–1973

Much of the variation in air quality over this period can be explained by the influence of a few emission sources. The decreased power generation at two downtown power plants resulted in the downtown census tracts being upgraded from a rating as some of the dirtiest areas in the city to an acceptable level. On the other hand, the increased emissions at the Florida Steel Corporation resulted in a significant degradation of air quality in the eastern part of Tampa.

Exposure to air pollution by income group

There is considerable variation in distribution of air quality across socioeconomic groups and across years. In 1970 and 1973, poorer air quality was found in the downtown area of Tampa and in the Davis Islands location. By 1976, the SO_2 problem at these locations was substantially eliminated. The TSP problem at these locations was also improved, but did surface in a new area with increased operations of the Florida Steel plant. In general, we find that the distribution of poor air quality is positively related to poverty, to low-value housing, to the aged and to the nonwhite population. The exception in 1970 and 1973 was the Davis Islands area, which had relatively poor air quality and yet is an area of high incomes.

We have inferred exposure to poor air quality based upon residence. To the extent that high-income individuals residing in low pollution areas work in the central city, the exposure patterns need to be adjusted. In addition, no adjustment was made for differences that may exist in exposure between high- and low-income groups because higher income people are more able to afford air-conditioning in their homes, cars, and places of work, as well as better medical care and other defensive measures to combat air pollution.

The observed relationships between air quality and income-related characteristics are probably due to a combination of factors. The locational patterns of electric generation plants, the port of Tampa, and the location of industrial activities have reflected transportation and material cost differentials. The housing price mechanism tends to filter older housing units located in central areas to low-income groups. High-income groups have been moving to suburban locations for a host of reasons, of which improved air quality is undoubtedly one factor. The Davis Islands section has amenities in its close-in location and in its access to Tampa Bay which have offset its relatively poor air quality in the past. It appears that in Tampa, improved air quality has conferred benefits based upon residence to both high- and low-income groups.

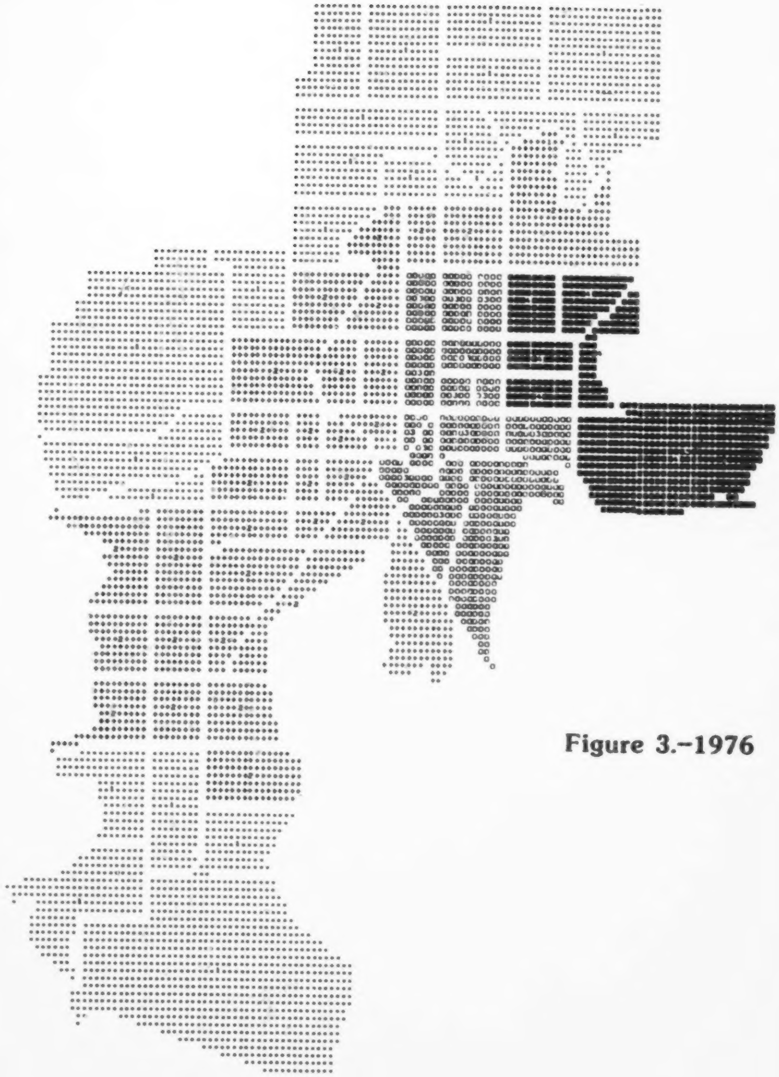

Figure 3.–1976

Property values as a benefit measure

The property-value method of estimating benefits of air quality improvements was applied to Tampa data. We estimated various equations in which the value of single-family owner-occupied homes for 1970 was regressed on a number of independent variables including air pollution. The results of the test were mixed and weak. That is to say, the level of air quality appeared to have at best a weak negative influence on property values given the relatively poor air quality in 1970. Our best data were with 1970 measures of TSP. The expected signs did not result and the levels of significance were low. Measures of SO_2 for 1973 had a negative influence which appeared to be statistically significant on 1970 property values. The 1973 measures of SO_2 are not reliable and appear to be well below the level of visual perception. Therefore, we tend to discount the SO_2 relationship on property values.

Because the 1970 regression studies were so poor, the use of more sophisticated property-value techniques to measure benefits would be a waste of time. The property-value method of estimating benefits from air quality improvement in Florida would appear to have little application. The levels of air quality in Florida appear to be relatively high. This means that differences in air quality at the census tract level are not likely to be perceived and therefore are not likely to be capitalized in land values. Benefits in improved air quality may well exist, but we suspect that the property-value method will not be successful in measuring them.

Tests of health effects

Mortality coefficients developed by Lave and Seskin[3] and by Liu and Yu[4] were used to estimate the possible decline in deaths in Tampa for changes in air quality (particulates for 1970-73, 1973-76, and for 1970-76). We have considerable reservations about applying these coefficients to Tampa data which are generally below federal primary standards for TSP.

The Lave and Seskin coefficients show that the improvement in particulates from 1970 to 1976 reduced premature deaths in Tampa by sixty lives. By contrast, the Liu and Yu equations suggest that the reduction in mortality for the same period was on the order of nine persons. We have little basis for accepting or rejecting either estimate.

It is not possible to document health benefits in Tampa for the 1970-76 period using the best data now available.

More complete air quality data and more complete mortality and morbidity studies using Florida data are needed before definitive answers can be reached.

Final observations

In the long run, the mounting costs of clean air regulation in Florida must be balanced against the benefits of pollution abatement programs. Measurement of benefits of improved air quality is a difficult task at best. The benefits are more evident when the levels of pollution are high. The task is easier when air quality and exposure are well-established and when dose-response functions are fairly well-defined.

Our knowledge of ambient air quality in Tampa is highly imperfect. Dose-response functions for the relatively good levels of air quality found in Tampa do not exist. The use of standard benefit measures has produced no reliable results. We believe that benefits exist, yet we cannot document them given the application of standard techniques and existing data.

Direct estimation of benefits cannot long be avoided or postponed if social efficiency and equality are to be attained. We do not know if our negative results stem from poor data or stem from low-level damage functions associated with low-level air pollution in Tampa. It is probable that both factors may be at work.

The rising costs of energy will force increasing examination of clean air regulation in terms of benefits and costs. This limited study highlights the need for full-scale examination of the benefits which are to be realized under Florida conditions. We cannot long continue to assert that the data to systematically and conclusively measure these benefits do not exist. The inescapable conclusion is that the benefits of air pollution abatement must be shown to outweigh the costs.

Benefit Measures of Air Quality Regulation in Florida is available from the Bureau of Economic and Business Research, 221 Matherly Hall, University of Florida, Gainesville 32611, at $5.00 per copy. Florida residents please add 4% sales tax.

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[3] Lester B. Lave and Eugene P. Seskin (1977), *Air Pollution and Human Health*, Johns Hopkins University Press, Baltimore, Maryland.

[4] B.C. Liu and E.S. Yu (1976), *Physical and Economic Damage Functions for Air Pollutants by Receptor*, Midwest Research Institute project for U.S. Environmental Protection Agency, 600-5-76-011, Corvallis, Oregon.

DISPOSING OF HAZARDOUS WASTE

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and
James H. Gapinski

Professors of Economics
Florida State University

The benefits to be expected from a proposed Hazardous Waste Control Program for the state would probably outweigh the modest costs of compliance with new regulations according to a study just completed for the Florida Department of Environmental Regulation (DER).

Though Florida has a significant amount of potentially hazardous industrial waste, generated primarily in Broward and Dade counties and in smaller amounts in Duval, Pinellas, and Hillsborough counties, the impact on industries and the state's economy of the DER's proposed legislation would be small.

In response to the proposed state program and to federal requirements in the Resource Conservation and Recovery Act and the Safe Drinking Water Act, the authors headed a study team which estimated potential compliance costs for significantly impacted manufacturing and electric utility industries. They formulated rough guides to lost output and employment for the Florida economy as well as potential benefits from the proposed program.

If the estimated value of the economic benefits is greater than the estimated value of the economic costs, public enforcement of the program can be judged economically worthwhile. The calculation of benefits-to-costs ratios requires a kind of social accounting to consider effects often thought to be noneconomic or nonquantifiable. In other words, the benefits of reducing or eliminating hazardous waste from the environment are also shown in the light of possibly reduced human mortality, improved human health, greater productivity, and increased amenities. Secondary benefits would include improvements in the quality of Florida's ecologically sensitive public water supplies and recreational waterways upon which Florida's tourist industry is heavily dependent.

Florida's manufacturing sector tends to be a small contributor to the total state economic picture and those industries which now contribute the major portion of the hazardous waste comprise but a small share of the total manufacturing sector and, therefore, a very small part of the state economy.

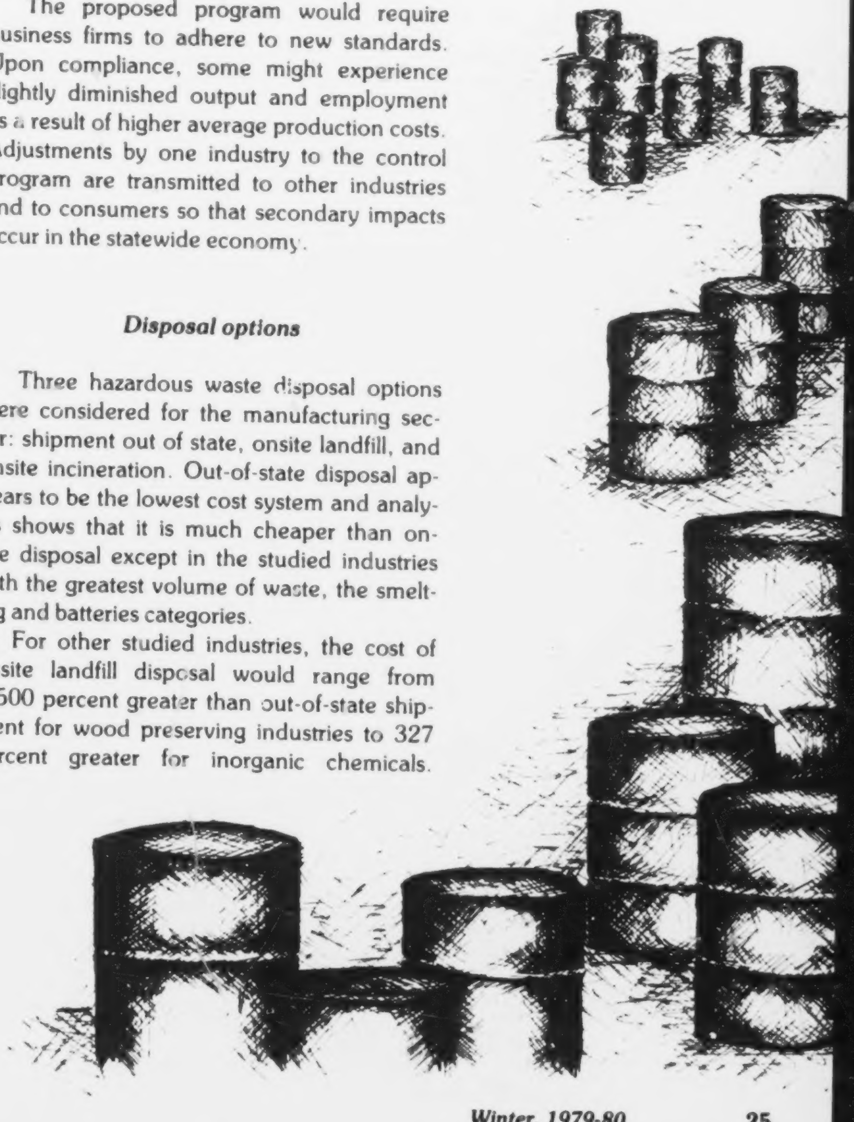
The seven manufacturing industries studied were wood preserving; inorganic chemicals; paint and allied products; pesticides and agricultural chemicals; primary metals, smelting, and refining; electroplating and polishing; and batteries. While these are significant waste generators, the seven form a subset of manufacturing that accounts only for 0.24 percent of state employment and 0.32 percent of state income. The seven industries also provide a reasonable representation of the average cost effects likely to result from the control program.

The proposed program would require business firms to adhere to new standards. Upon compliance, some might experience slightly diminished output and employment as a result of higher average production costs. Adjustments by one industry to the control program are transmitted to other industries and to consumers so that secondary impacts occur in the statewide economy.

Disposal options

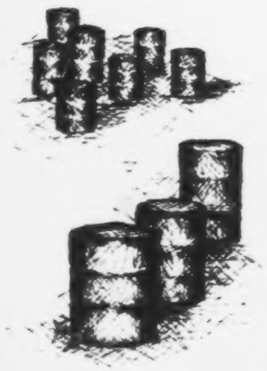
Three hazardous waste disposal options were considered for the manufacturing sector: shipment out of state, onsite landfill, and onsite incineration. Out-of-state disposal appears to be the lowest cost system and analysis shows that it is much cheaper than onsite disposal except in the studied industries with the greatest volume of waste, the smelting and batteries categories.

For other studied industries, the cost of onsite landfill disposal would range from 7,500 percent greater than out-of-state shipment for wood preserving industries to 327 percent greater for inorganic chemicals.



Study of the technical costs of controlled onsite incineration suggests that this method too is more expensive than out-of-state landfill disposal.

Out-of-state disposal costs per metric ton vary directly with the distance between the generator and the disposal site. For the seven manufacturing industries combined, estimated annual disposal costs are $342 per metric ton of waste, or $1.50 per Floridian.



The proposed waste control program could prompt development of disposal facilities not now available within the state as small generators seek less expensive compliance methods. One possibility is the transfer station, a common holding site for wastes earmarked for later shipment out of state. These stations would eliminate less-than-truckload hauls over long distances and would therefore reduce transportation costs. Development of commercial secured landfills and controlled incinerators consonant with the proposed program would have a similar effect.

Three of the seven manufacturing industries were chosen for in-depth study to estimate secondary or statewide impacts. The three—organic chemicals, paints and allied products, and batteries—combined comprise a representative sample from which the experiences of all seven industries can be projected. The three industries account for half of the total waste generated and slightly more than half of total employment in the seven industries.

In translating the unit cost of disposal into initial industry employment and income losses, the abilities of the firms to pass along unit cost increases to the consumer as higher prices were considered. Such capabilities depend upon industry and market structures that influence the sensitivities of consumers to price increases. Any reduction in purchases was translated into production and thus employment reductions. Two cost pass-through policies were considered and various price sensitivity ranges were used in calculating the direct effects upon the firms.

Under 100 percent pass-through, all seven industries experience a maximum employment loss of 75 workers and a maximum wage and salary income loss of $916,000. The employment cutback is equivalent to 0.92 percent of the 8,160 persons working in the seven industries; the income loss likewise represents 0.92 percent of the seven's $99,618,000 income level. These results suggest that even in this "worst case" estimate the economic impact of the program on all seven industries would be *small*.

To calculate the employment and income effects statewide, economic multipliers must be used. For example, an increase in unemployment of fourteen workers in organic chemicals may lead to another fourteen workers being laid off in related industries. In this example, the multiplier would be two.

Upon using various multipliers, it can be determined that the application of the waste control program would likely result in a manufacturing employment loss of, *at most*, 319 workers statewide. This figure translates into 0.085 percent of Florida's manufacturing employment and 0.010 percent of total state employment. Maximum personal income forfeiture equals $4,809,000 or 0.114 percent of wages and salaries originating in the manufacturing sector and only 0.008 percent of personal income in the state.

These statewide employment and income declines continue to remain small when forecast over several years. The smallness of these declines is underscored when we consider that the multiplier process may work more gradually than assumed and that firms complying with the waste control program might cut employee positions rather than actually fire workers. Moreover, that proposed program could prompt employment and income expansion elsewhere in Florida, further ameliorating the costs.

Analysis of the coal-fired generating plants of the electrical power industry diverges in certain respects from the procedure used for the manufacturing sector because of the uniqueness of the utility. We confine our analysis to the so-called "nonregenerable" plants inasmuch as no "regenerable" plants—those that recycle and market wastes—are planned for Florida and their average costs of production, including environmental equipment, are extremely high. Furthermore, we only include in the study the newly planned and sited coal-fired plants because proposed regulations apply solely to *new* plants.

The least-cost disposal process is stabilized cake with formation of liner and dikes from sludge with an estimated average cost of disposal in 1983 dollars of 0.051 cents per kilowatt hour (KWH) for a 1200 megawatt model plant and 0.068 cents per kilowatt hour for a 600 megawatt plant.

The total estimated demand and output shrinkage by 1985 is 36,072 KWH for Florida. However, the total demand and output shortfalls by year are small shares of total projected demand: 0.0014 percent in 1981, 0.0045 percent in 1982, 0.0148 percent in 1983, 0.0212 percent in 1984, and 0.0312 percent in 1985.

Estimated secondary effects yield a statewide employment drop of 36 workers in 1981, rising to a maximum of 1,542 workers in 1985, a reduction in projected Florida nongovernment employment by only 0.001 percent in 1981 and 0.046 percent in 1985.

The greatest impact of compliance would emanate from responses in the utility industry. However, the estimates from all eight (seven manufacturing and the utility) industries studied were made in such a way that their combined statewide impact could be calculated.

In the first year of the coal-fired generator effects, 1981, Florida would experience a total estimated loss in employment of 42 or only 0.001 percent of projected 1981 Florida nongovernment employment. In 1985, the year of greatest impact, the total estimated loss would be 1,550 workers, still only 0.046 percent of projected Florida nongovernment employment. Florida's total estimated personal income reduction would be about $1 million or only 0.003 percent of projected Florida current personal income in 1981. Florida's total estimated current personal income loss would rise to $36.5 million in 1985, still less than one-tenth of 1 percent of Florida's projected 1985 personal income.

Calculating benefits

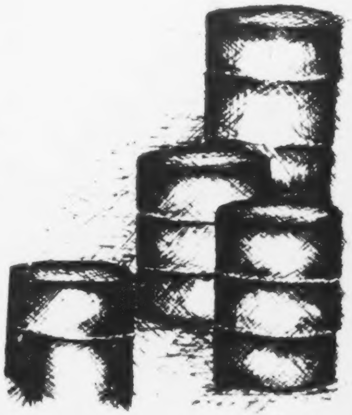
The *benefits* from the control of hazardous waste equal the value of damages in the absence of regulation. Damages from hazardous substances cover a broad spectrum from wildlife destruction and general ecological decay to a higher human mortality rate and diminished health. The latter consequences would increase the demand for state supported health services. Where damages affect the labor force, worker productivity would be reduced and worker's compensation and unemployment compensation costs would rise. Since public notification to the news media is required by the federal statutes, the publicity effect of any water quality degradation might also adversely impact Florida tourism. To the extent that measurable health deterioration of some share of the affected population also is publicized, knowledge of such damages would probably adversely affect tourism as well.

The Florida aquifers are geologically very vulnerable and thus susceptible to contamination. Since every person in a particular region drinks water and bathes, the probability of contact with existing contaminated water is high. It is this certainty of health damage (of some kind) which has led to a concern with maintaining the quality of potable water.

In the assessment of economic benefits in the Florida case, we conclude that the greater the quantity of contaminants per square mile and the greater the population for the same area, the greater the probability that the contaminants would find their way into the water supply and in turn adversely affect a large share of the population. Some 97 percent of the quantity of total potentially hazardous waste in Florida is found in the five aforementioned counties (Broward, Dade, Duval, Hillsborough, and Pinellas) in which 54 percent of the Florida population resides.

The most recent survey of the quality of public drinking water found concentrations of heavy metals in these counties. If the waste streams of the existing industries contribute even marginally to these heavy metal concentrations, severe health damages could be inflicted on the Florida population. The potential hazard is so great that consideration should be given to eliminating the hazard altogether wherever the economic costs are reasonable.

The estimated combined economic cost of compliance to the State of Florida among the eight industries studied would be a negligible share of projected state employment and income. The magnitude of such shortfalls is easily offset by modest growth in other industries. The value from possible avoidance of potential water-supply contamination and possible health damage and mortality increases—though difficult to calculate with exactitude—most probably outweighs the estimated modest costs of compliance.



Management Center Short Courses 1980

The Management Center in the College of Business Administration offers a variety of programs in which the most current thinking and trends of importance to the general manager are examined in detail. Ranging from the week-long Executive Program to a series of two-day seminars, the Center seeks to provide a learning setting and programs in which managers of all levels may sharpen their skills and improve their effectiveness.

The Executive Program

Foremost among the programs is the Executive Program, which runs from Sunday evening through Friday afternoon, February 17-22, 1980. According to Henry Tosi, director of the Management Center, "The specific objectives of the program are to make available critical managerial information, to share ideas among managers from various organizations, to learn to identify the environment in which the organization operates, and to improve problem solving in financial management, marketing and distribution, personnel management, and organization of personal work setting." The instructional faculty, drawn primarily from the University of Florida, leads a series of half-day discussions on such topics as How to Live with Regulation, Getting the Most From Problem Managers, and Managing Consumers and Markets. Lectures, group discussions, exercises, simulations and case studies will be used, as necessary, to clarify the various topics.

Development Programs

The Management Center is also offering sixteen two-day development programs during the academic year 1979-1980. These programs are similar in both purpose and method to the Executive Program, but they are aimed at improving specific managerial skills.

All the programs are conducted in Gainesville, using the seminar and discussion facilities of the University community, and at the same time offering the opportunity for participants to become involved in the activities of the campus. Registration for the programs is limited to allow each individual ample participation in learning from the instructor and the experience of others.

Additional information and application forms may be obtained by writing:

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College of Business Administration
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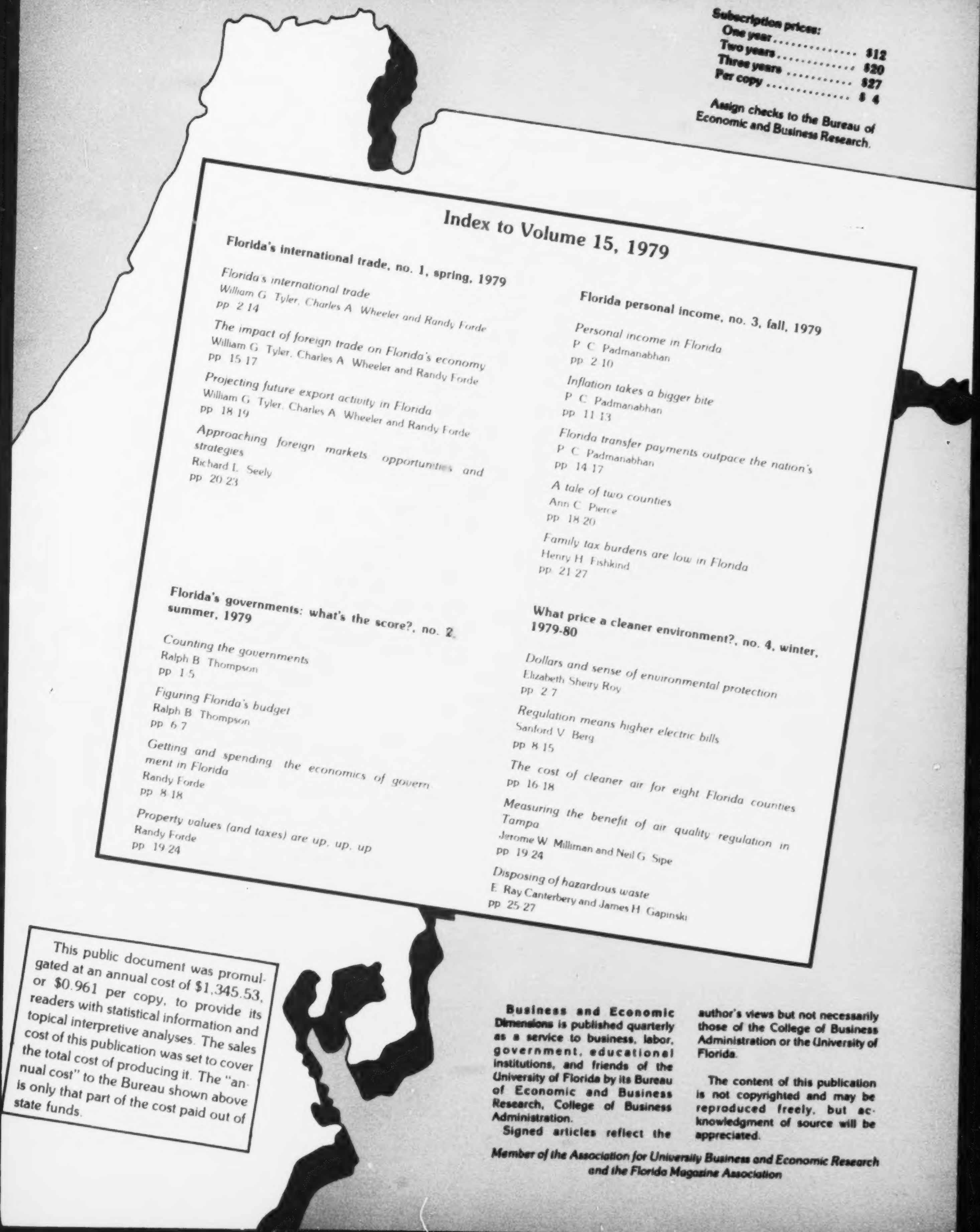

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Index to Volume 15, 1979

Florida's international trade, no. 1, spring, 1979

Florida's international trade
William G. Tyler, Charles A. Wheeler and Randy Forde
pp. 2-14

The impact of foreign trade on Florida's economy
William G. Tyler, Charles A. Wheeler and Randy Forde
pp. 15-17

Projecting future export activity in Florida
William G. Tyler, Charles A. Wheeler and Randy Forde
pp. 18-19

Approaching foreign markets: opportunities and strategies
Richard L. Seely
pp. 20-23

Florida's governments: what's the score?, no. 2, summer, 1979

Counting the governments
Ralph B. Thompson
pp. 1-5

Figuring Florida's budget
Ralph B. Thompson
pp. 6-7

Getting and spending: the economics of government in Florida
Randy Forde
pp. 8-18

Property values (and taxes) are up, up, up
Randy Forde
pp. 19-24

Florida personal income, no. 3, fall, 1979

Personal income in Florida
P. C. Padmanabhan
pp. 2-10

Inflation takes a bigger bite
P. C. Padmanabhan
pp. 11-13

Florida transfer payments outpace the nation's
P. C. Padmanabhan
pp. 14-17

A tale of two counties
Ann C. Pierce
pp. 18-20

Family tax burdens are low in Florida
Henry H. Fishkind
pp. 21-27

What price a cleaner environment?, no. 4, winter, 1979-80

Dollars and sense of environmental protection
Elizabeth Sherry Roy
pp. 2-7

Regulation means higher electric bills
Sanford V. Berg
pp. 8-15

The cost of cleaner air for eight Florida counties
pp. 16-18

Measuring the benefit of air quality regulation in Tampa
Jerome W. Milliman and Neil G. Sipe
pp. 19-24

Disposing of hazardous waste
E. Ray Canterbery and James H. Gapinski
pp. 25-27

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1 - 1980

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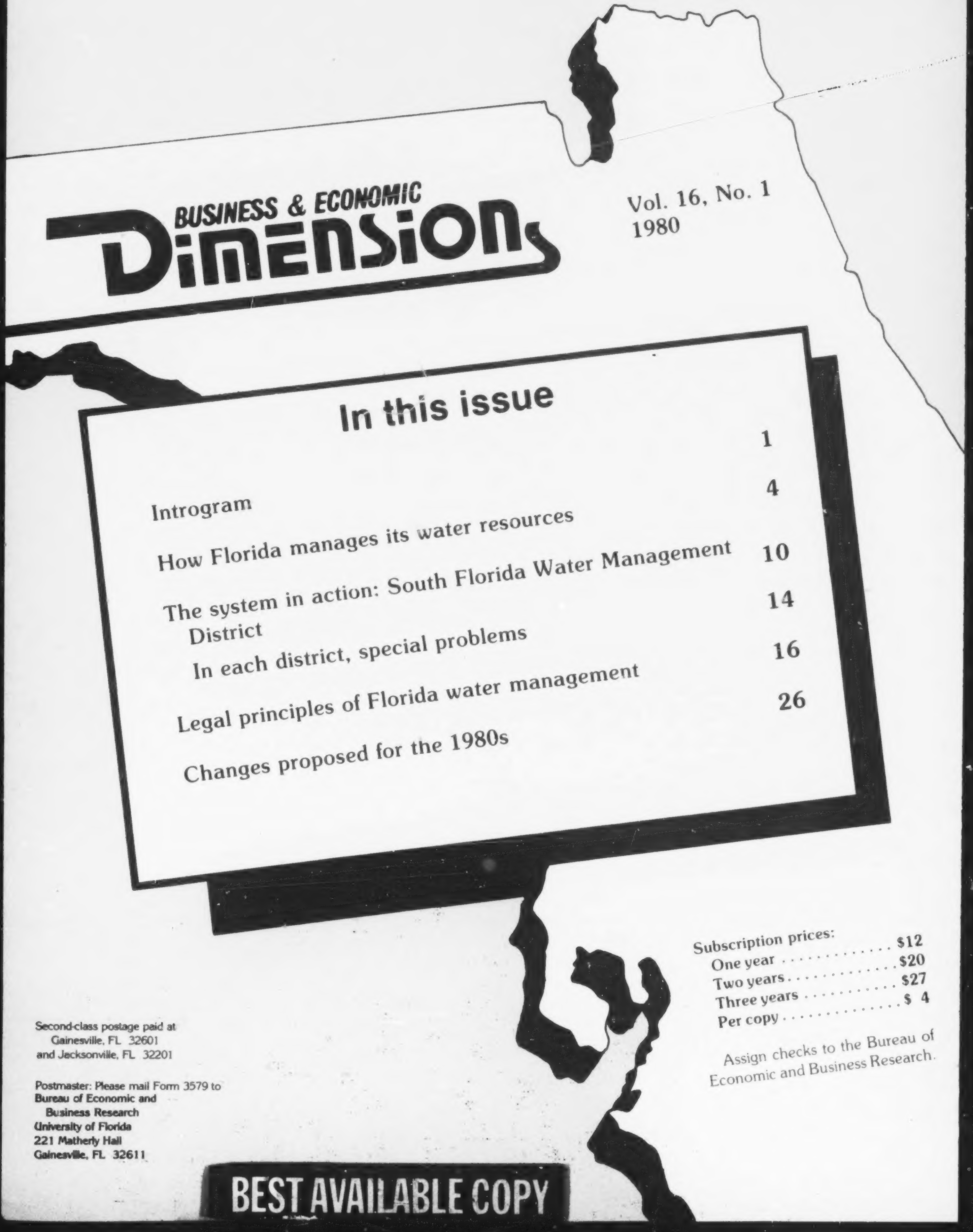

BUSINESS & ECONOMIC DIMENSIONS

Vol. 16, No. 1
1980

In this issue

Introgram 1
How Florida manages its water resources 4
The system in action: South Florida Water Management District 10
In each district, special problems 14
Legal principles of Florida water management 16
Changes proposed for the 1980s 26

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introgram

As one stands on a Florida beach he is reminded of the cry of the ancient mariner: "Water water everywhere, nor any drop to drink." Will this state, surrounded as it is by the sea and enjoying annual rainfalls in various sectors of from forty to sixty inches, find itself becoming a potential Sahara with ever decreasing supplies of water of ever poorer quality for an ever increasing population? Such fears have been expressed with greater frequency and intensity in recent years.

In an effort to explore some of the questions of water supply and its management, *Business and Economic DIMENSIONS* is pleased to present several ideas and viewpoints. Readers are cautioned, however, to recognize that the problems of the quantity and the quality of water for the people of Florida are extremely broad and varied. This issue makes no pretense of being comprehensive or complete.

As an introduction of the subject we publish a short summary of Florida's water problems by Dr. S. F. Shih, associate professor of agricultural engineering in the Institute of Food and Agricultural Sciences of the University of Florida. Dr. Shih is located at Belle Glade and was formerly senior systems engineer with the South Florida Water Management District. He describes the basic nature of the supply and usage of water in Florida.

Following this is a rather complete but still fairly concise history of efforts, beginning in 1847, to manage and control the water supply of the state. Both the development of physical facilities and the legislation directed to the problem of water management are discussed by Professor John M. DeGrove, director of the Joint Center for Environmental and Urban Problems of the Florida Atlantic and Florida International Universities in Boca Raton.

A description of the South Florida Water Management District plus comments by spokesmen for all five of the water management districts is included. Readers will readily appreciate that these districts operate in quite different ways because of the variations in the topography, rainfall, surface waterways, underground

(continued on page 2)

waterways, population, and industrial and agricultural uses in each district. Some differences in attitudes regarding the appropriate political philosophies to be followed are suggested.

A fuller statement of the legal aspects of the question follows. This was prepared by Dean Emeritus Frank E. Maloney of the Holland Law Center at the University of Florida in Gainesville. Dean Maloney traces the evolution of water law from English common law down to Florida's landmark environmental and planning legislation of the seventies and the changing concepts used in lawmaking about water.

In January, 1979, Governor Bob Graham commissioned a task force of eighteen members to review the performance of the laws and government in managing Florida's resources, including water. A brief description of this review and the recommendations of the task force are included in an article prepared by Nancy Stroud, an attorney and a research associate with the FAU-FIU Joint Center for Environmental and Urban Problems who was staff coordinator for the task force.

Looked at from an economic as well as from a physiographic and environmental viewpoint, one question that arises in water management was stated by Professor of Economics J. W. Milliman of the University of Florida in an article in *The Florida Outlook*: "Is the availability of existing and future water supplies to be used to control growth or are existing and future water supplies to be provided to accommodate growth?"

People in Florida can surmise something of the possible future by considering the aqueduct system which provides New York City with water from as far away as the Delaware River and the extensive system developed to bring water to the City of Los Angeles.

—Ralph B. Thompson

AN OVERVIEW: general water problems in Florida

S. F. Shih

Associate Professor of Agricultural Engineering
Institute for Food and Agricultural Sciences

The major problems in the management of Florida's water system can be explained through a brief discussion of input (rainfall) and outgo (water usage).

Rainfall

Five special characteristics are involved in Florida's rainfall pattern. The first is the storm event. Most measuring stations have experienced two-hour rainfall in excess of three inches and a twenty-four-hour amount of ten inches or more. A rainfall of thirty-nine inches during a twenty-four-hour period was recorded at Yankeetown in 1950.

The second is the uneven distribution of rainfall within the year, with about 75 percent of the total occurring during the wet season (May through October) and 25 percent in the dry season (November through April).

The third is the extreme deviation on a yearly basis. For example, 37 inches in a dry year and 109 inches in a wet year were recorded at Palm Beach Airport.

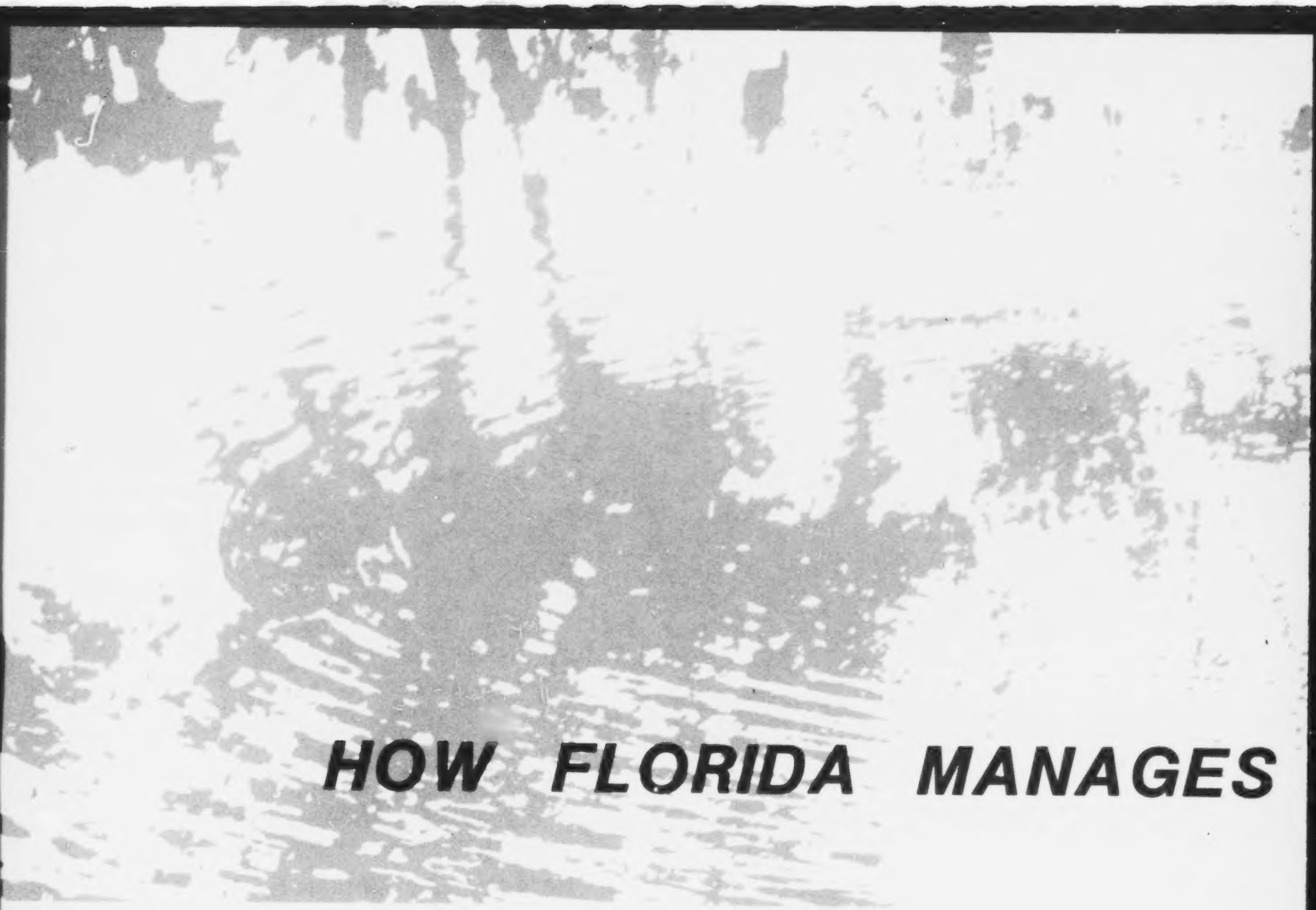
The fourth is the spatial disturbance. For example, the normal annual rainfalls for Miami Beach and for the Miami Airport are forty-six and sixty inches, respectively. The distance between those two stations is about ten miles.

The fifth is the trend of decreasing rainfall since 1960.

The uneven distribution of rainfall leads to two complicated problems for water resources management. First, the storage of excess rainfall to meet the need in deficit periods is a problem due to the flat topography in Florida. It would require a large surface area to store the water. Lake Okeechobee, with about 700 square miles of surface area, can store only about 4.5 million acre feet of water. Transportation of the excess water from one location to another is also a problem due to the flat slope. It requires not only a higher density of canal system per unit area but also large pumping facilities in some locations. For example, there are about 1,600 miles of canal system involved in the South Florida Water Management District. The S-5A pumping station is the largest low-head pumping facility in the world.

Water usage

The four major water usage sectors in Florida are self-supplied industry, thermoelectric power generation, domestic supply, and agriculture. Water use for self-supplied industry and thermoelectric power generation can be estimated quite accurately, but estimation of water usage in the domestic and agriculture sectors is very difficult. For example, domestic water demand is not confined only to the permanent residents but also includes tourists, whose numbers vary within a year, between years and by location. The other complicated problem in estimating water usage is the agricultural water demand which varies with season, crop types, location, and water management schemes.



HOW FLORIDA MANAGES

This article is a condensed and edited version of a paper published previously as part of the proceedings of a Southeast Regional Water Conference. An expanded version of this paper, including full documentation, is available from the author at the FAU-FIU Joint Center for Environmental and Urban Problems, 1515 West Commercial Boulevard, Fort Lauderdale, Fla., 33309

John M. DeGrove

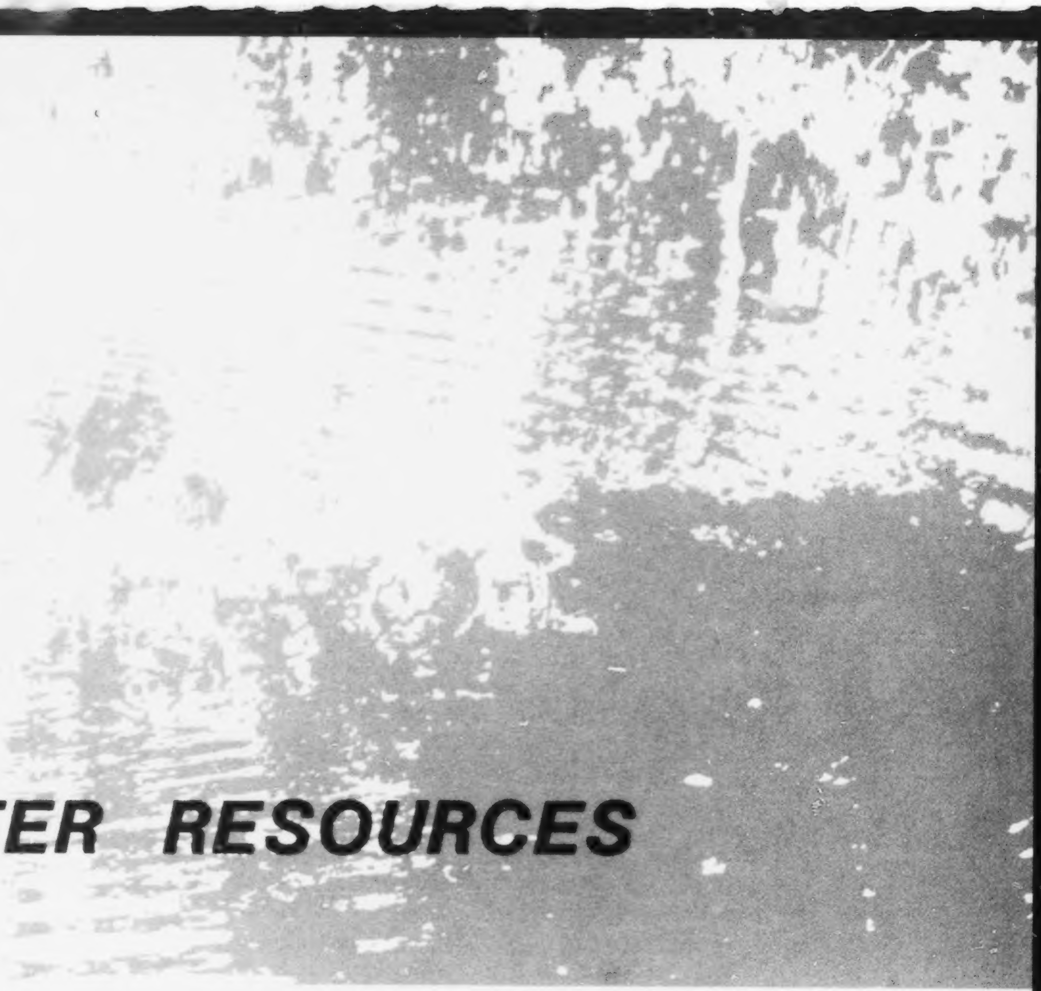
Director
FAU-FIU Joint Center for Environmental and Urban Problems

The history of water management in Florida until very recent times consisted of vigorous efforts to drain and reclaim all wetlands in the state and to devise methods of getting rid of flood waters as rapidly as possible, all in the name of promoting maximum development. From the time of the first discussions by a state senator concerning draining and reclaiming the Everglades and surrounding areas in 1847, the focus of water management in Florida has been on drainage, flood control, and the promotion of rapid development.

Drainage and flood control did in fact make possible the development of large areas of land, particularly in south Florida, for both agricultural and residential use. Thus the objectives of Florida's water management programs were realized. However, unanticipated consequences of the programs began to emerge in the 1930s in the form of saltwater intrusion into the freshwater aquifer in south Florida and in the form of overdrainage in much of south Florida during droughts.

After World War II, Florida experienced a population expansion unprecedented in the nation. That boom was at first welcomed with great enthusiasm but in the late 1950s and into the 1960s the rapid population growth and the emergence of the environmental movement brought fundamental changes in attitudes in Florida toward growth—changes that in turn had a dramatic impact on the approach to water management in the state.

Some of the major negative impacts of inadequate water management in the face of explosive growth had by the 1960s become painfully clear. The saltwater intrusion problem continued; major water shortages were occurring in the heavily urbanized lower east coast and in the Tampa Bay area; the destruction of wildlife habitats was widespread; the pollution of water was endemic in heavily urbanized areas, and industrial and agricultural-based pollution was a problem in many rural areas; and the actual



ITS WATER RESOURCES

threat of "running out of water" during severe droughts had become very real in some sections of the state.

The state's response to an obvious need for more effective land and water management began to produce major responses: establishment of the Florida Air and Water Pollution Control Commission in 1967; a new and broader-based department including solid waste and noise abatement responsibilities authorized by the legislature in 1969.

Major environmental problems such as the Cross-Florida Barge Canal, the threat of overdrainage to the water supply for Everglades National Park, the threat to critical water recharge areas such as the Green Swamp near Tampa, and other perceived crises were brought to a head by a severe drought in 1970 and 1971. Saltwater intrusion on both coasts, the call for water rationing, and a general realization that the state had no policy or administrative mechanisms to effectively manage its water in the face of a continuing series of crisis-level problems caused the legislature to take far-reaching action in 1972 in both the land and water management areas.

Newly elected Governor Reubin Askew convened a Governor's Conference on Water Management for South Florida in August, 1971, to recommend action to cope with the emergency drought conditions then gripping that area. The conference broadened its mandate to consider the whole problem of land and water management in the state. The governor then established a Task Force on Resource Management that in turn presented four major pieces of 1972 legislation: the Environmental Land and Water Management Act, the Water Resources Act, the Land Conservation Act, and the Comprehensive Planning Act. While the Environmental Land and Water Management Act received more national attention than any other, it seems fair to say that the Water Resources Act was in some

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> ***. . . . the legislature further stressed the importance of cooperative efforts . . . to meet the water needs of rapidly urbanizing areas in a manner which will supply . . . water where needed without . . . adverse effects upon the areas (where) such water is withdrawn . . . .***

ways the most far reaching and the most significant piece of legislation adopted in that historic package.

The Water Resources Act of 1972

This legislation, the first comprehensive effort by the state to set the framework for planning and regulating the use of its water resources, was rooted in the work of the Holland Law Center at the University of Florida in its effort to develop a model water code. It is discussed in detail in the article by Dean Frank Maloney in this issue.

The language of the policy section of the act is very broad and comprehensive and clearly includes the consideration of water quality and land management issues as they relate to the regulation of surface and groundwater. The act put in place a broad and comprehensive grant of power to state and regional agencies that involved the planning and regulation of virtually all surface and groundwater activities in the state. The state planning and management framework was melded with the delegation of much of the implementation of the act, in both the planning and regulatory areas, to the five water management districts (WMDs) authorized by the legislation.

The regional districts covered the entire state, and were to be governed by a nine-member citizen board appointed by the governor and serving without compensation except for expenses. Two of the districts had existed for a considerable period of time before passage of the act. The South Florida WMD was established as the Central and Southern Florida Flood Control District in 1949, and the Southwest Florida WMD was established in 1961. Both of these districts had taxing power by special law authorizing them to levy up to one mill of ad valorem taxes on the real property of the district. The South Florida WMD covered all or parts of seventeen counties, stretched from the Orlando area down through the Florida Keys, and included a property tax base in 1976 of some $50 billion. The newer districts established in the north central, northeast, and northwest Florida areas were equally large in a geographic sense, but much smaller in population and in the immediacy of the water problems they faced. The exception was the St. Johns River WMD, which included large parts of the urban area of Orlando, the Jacksonville area, and the Upper St. Johns River Basin, including areas north and south of Daytona.

In a 1974 amendment, the legislature further stressed the importance of "cooperative efforts between municipalities, counties, water management districts, and the Department of Environmental Regulation." Such efforts were seen to be "mandatory in order to meet the water needs of rapidly urbanizing areas in a manner which will supply adequate and dependable supplies of water where needed without resulting in adverse effects upon the areas from whence such water is withdrawn." This particular provision was intended among other things to encourage a cooperative effort in the Tampa Bay area involving a rather sharp controversy between various counties as to the degree to which each county could draw water from the aquifer, particularly when one county was drawing water from wells in another county.

The administrative framework

Prior to the enactment of the Environmental Reorganization Act of 1975, the administration of water resources in the state was sharply fragmented. Three agencies had major responsibilities for water quality and water quantity planning and regulation, including the Department of Natural Resources, prior to 1975 the state agency overseeing WMDs; the Department of Pollution Control, the agency responsible for air and water pollution standards; and the Department of Health and Rehabilitative Services, whose Bureau of Sanitation was responsible for enforcing drinking water regulations. Thus responsibility for water quantity management was in a separate agency from the one responsible for water quality. The impossibility of separating these two critical components of water management without sacrificing a comprehensive approach was a major factor in causing the legislature to put both elements into the same state agency as part of the 1975 reorganization.

The Environmental Reorganization Act of 1975 made sweeping changes, providing a new framework for the regulation of almost all surface and groundwater activities and taking the water use functions out of the hands of the Department of Natural Resources and putting them in a new Department of Environmental Regulation (DER). Thus water quantity and water quality, including the responsibility for drinking water controls, were brought together in the same agency for the first time.

Implementation of the system went forward very slowly. Part of the difficulty in carrying out the act involved the question as to whether any boundary changes could take place unless and until the question of the ability of new WMDs to levy ad valorem taxes was cleared up. Because of constitutional changes made in 1968, only a vote of the people could authorize the new WMDs to levy such taxes. This problem was not solved until 1976, when a constitutional amendment was adopted allowing each WMD to levy up to one mill of ad valorem taxes. Political reality mandated the statewide approach. Most observers felt that if the vote had been taken in each of the new WMDs, it would have failed in all three. In a statewide vote, the voters in the two older WMDs, already paying an ad valorem tax for water management purposes, were willing to extend that opportunity to their fellow citizens in the newly established WMDs. The voting pattern in the election did in fact confirm this political judgment.

The Department of Natural Resources had taken a rather permissive approach to the whole matter of implementing the 1972 legislation, and had not really pushed the implementation of the act in its relationships with the WMDs. Furthermore, funding provided by the legislature for the new WMDs, ranging from $400,000 to $500,000 per district per year, was not adequate to support a rapid implementation of the act. The 1975 Reorganization Act, followed as it was by the clarification of the fiscal problems in 1976, set the stage for a more vigorous implementation effort. It is true that even prior to this time the older existing districts, especially the South Florida WMD, had moved promptly to put in place the regulatory system authorized by the 1972 regulations.

DER established a full-time coordinator; instituted quarterly meetings of the staffs of the WMDs with the staff of DER; began the publication of a newsletter to keep all the districts more closely informed as to what was happening at the state level and in other WMDs; and instituted a number of programs designed to more closely coordinate the work of the regional WMDs with DER at the state level. Included in this surveillance was a performance or program audit mandated by the state legislature which was completed by DER in 1976 and updated in 1977.

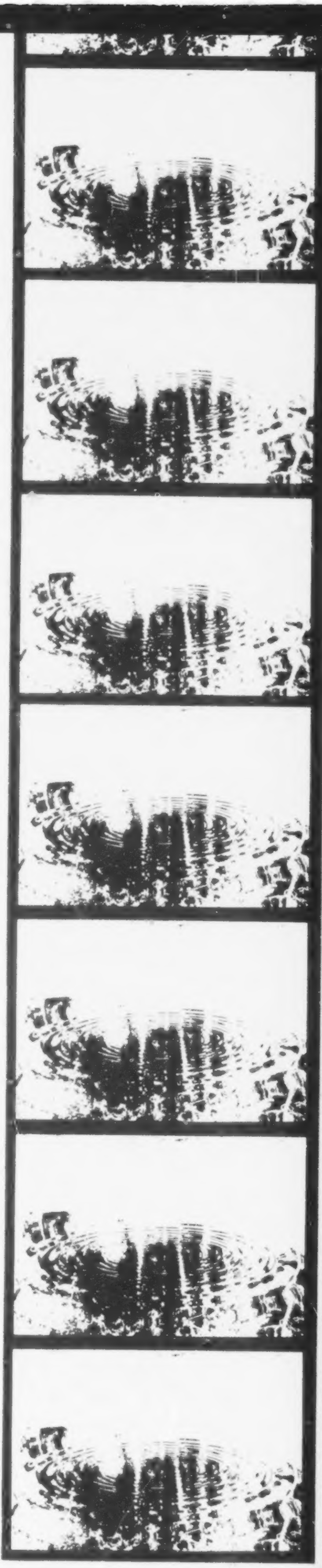
In an effort to insure a closer coordination between water quality and water quantity concerns, the 1975 Reorganization Act directed the establishment of four regional districts for DER that for the most part fit with the boundaries of the five WMDs. Furthermore, the headquarters of the state agency's district units are located with the headquarters of the WMDs whenever that is possible.

Planning and regulation

Planning

Regulatory efforts at both the state and regional levels have gone forward at the same time that the planning process has been put into place. The planning process involves DER and the WMDs and is largely focused on the problems of surface and groundwater management—the so-called water quantity dimension of the overall water resource management problem. However, water quality considerations have not been absent in this planning effort. The Water Resources Act requires the development of a state water use plan, and also directs DER to work closely with the Division of State Planning of the state Department of Administration in its effort to develop a comprehensive state plan, particularly with reference to the water element of that plan.

The planning system involves the development of regional water use plans by each of the five WMDs, within a planning framework supplied by DER. All the regional



water use plans have been submitted to DER, but action on the state water plan has been postponed pending the outcome of the recommendations of the governor's Resources Management Task Force. (See the article by Nancy Stroud in this issue.)

With regard to the water quality planning effort, it also is rather far along, but not complete. The broad-based planning carried out under section 303(e) of the Federal Water Pollution Control Act Amendments is generally complete, having consisted largely of gathering baseline data on water quality. Had the planning process gone forward in a wholly rational way, the next step would have been to complete the section 208 area-wide planning and then to proceed to the section 201 facilities planning. The fact is that section 201 planning is far ahead of section 208 planning, largely because the Nixon Administration did not release funds for the 208 effort in a timely way. As a result, the middle link in the water quality planning process fell behind.

In Florida, 208 planning is divided into designated and nondesignated areas. The twelve designated areas are, for the most part, administered through regional planning councils which in turn deal with cities and counties in bringing about the planning effort. Plans for all twelve areas have been received by DER, conditionally certified by the governor and submitted to the federal Environmental Protection Agency.

. . . . the importance of the planning process to the regulation effort is difficult to overestimate . . . .

DER is responsible for undesignated areas' plans, which include five elements: forestry, agriculture, mining, urban construction and septic tanks. The first two elements have been completed and conditionally certified by the governor. Work on the remaining elements is in progress.

The 201 facilities planning is carried out by cities and counties through a program administered by DER. All the planning efforts were to be ultimately integrated into the state water plan and made part of the water element of the state comprehensive plan. DER convened meetings between key participants in both the water quality and water quantity planning areas to ensure effective coordination.

The importance of the planning process to the regulation effort is difficult to overestimate. Regulation in the absence of an effective planning framework tends to take the form of case-by-case decisions that are not related to broad goals and policies that will maximize the effective management of the state's water resources. It might be argued that it would have been better to complete the planning before the regulation process even began. Unfortunately, Florida did not have the option of waiting for several years to allow the establishment of a planning framework to guide the regulatory system. The problems were immediate and pressing. Action to cope with them in the form of environmental regulations could not be postponed without courting even more problems of major proportions.

Regulation

The Water Resources Act of 1972 included a choice as to when and by whom the regulation of surface and groundwater would be initiated: from the state level or by the five WMDs. The Department of Natural Resources prior to 1975 and DER after 1975 have chosen to delegate the implementation of surface and groundwater management regulation to WMDs. The degree to which this delegation has been used is uneven, ranging from an early initiation of regulations in the two older WMDs serving the populated south Florida and Tampa Bay areas, to no initiation of regulations in two of the WMDs in the less populated areas of the state. The St. Johns WMD has a program in part of its district.

There is every reason to believe that the flexibility built into the original law was well founded. The newer WMDs have had a difficult time gearing up and simply collecting baseline data and initiating the planning process. They have not been in a position to launch a comprehensive regulatory program, nor is there as pressing a need for such a program in the north and northwest portions of the state as in those highly populated areas where water problems were already great and in some cases had reached crisis proportions. It was not only possible but absolutely necessary to go ahead with a comprehensive regulatory system there.

The South Florida WMD was the first to put a comprehensive surface and groundwater regulation system online, and it became effective March 1, 1974. The Southwest Florida WMD, covering the Tampa Bay area, followed shortly thereafter. The other three districts are in the process of data collection and, in the case of the St. Johns River WMD, are just moving into rulemaking and regulation of at least certain portions of the district. The South Florida WMD will be treated in detail in the next article. The Southwest Florida WMD by 1976 had issued over 2,000 surface water permits. The St. Johns River WMD as of January 1, 1977, had adopted a rule to cover the regulation of surface waters and planned to implement the regulations in one of its basin areas as of that date. The other two WMDs have drafted rules but have no immediate plans to put the regulations in place.

The second major area of regulation involves controlling the withdrawal of groundwater through consumptive use permits. This authority extends to all agencies, public and private, which use any substantial amount of water, with a statutory exemption of water used for household purposes. The consumptive use permitting system is in place in three of the WMDs, has been addressed but not implemented in a fourth, and has not been addressed in the Suwannee River WMD. The Southwest Florida WMD issued, between January 1, 1975, and January 20, 1980, some 5,344 permits for consumptive use. The St. Johns River WMD began implementation of this section on January 1, 1977.

The regulations involving surface and groundwater uses are only part of the regulatory systems envisaged in the act and being implemented in one or more of the WMDs. Other aspects of the system include rules covering the enforcement of adopted regulations; special rules for handling water shortage situations; systems and regulations to prevent saltwater intrusion; and control of deep well injection. The last involves both quantity and quality aspects of water and has been the subject of experimental research in two districts.

While there have been many problems in bringing about full implementation of the Water Resources Act, it seems fair to say that much has been accomplished. Florida does have a far-reaching piece of legislation that gives state and regional units broad powers to regulate surface and groundwater within state and regionally adopted water plans. Administrative mechanisms seem adequate to the task of implementing this planning and regulatory system. The system does seem to be adequately financed through a system of regionally based property taxes and state funding. The joining of water quality and water quantity problems is now much easier with both of these responsibilities located in the same state agency.

. . . . while much has been accomplished, it is certainly true that substantial problems do remain . . . .

While much has been accomplished, it certainly is true that substantial problems do remain. First there needs to be a clearer and more effective link between the implementation of the Water Resources Act and the Environmental Land and Water Management Act. The lead state agency with regard to the Environmental Land and Water Management Act is the Division of State Planning; yet in the implementation of developments of regional impact and areas of critical state concern, water quality and quantity problems are of great importance. Some coordination links do exist, but both at the state and regional level there needs to be a strengthening of this coordination and a clarification of lines of responsibility. This is especially true with regard to the regional level, where the WMDs and the regional planning councils both are involved in important aspects of water planning and management.

A more effective and efficient melding of water quality and water quantity responsibilities of DER is also needed, including a clearer picture of the role that WMDs will play with regard to water quality as well as water quantity management. This problem is in turn linked to the need to simplify permitting, where the pressures are similar to those in the rest of the country to make the whole process more effective and more efficient. Substantial progress along this line has been made, with DER working out agreements with some of the WMDs, so an applicant will not be needlessly held up by going through two entirely separate permit approval processes.

the system in action:

South Florida Water Management District

John M. DeGrove

Director
FAU-FIU Joint Center
for Environmental
and Urban Problems

The South Florida Water Management District was the first in the state to initiate a complete regulatory system involving both surface and groundwater. Because of that, it will be used as a case study to illustrate the elements of water use administration systems in Florida.

The South Florida WMD includes all or part of sixteen counties, stretching from the Disney World area of Orlando through the Florida Keys, a distance of some 400 miles north to south. The district includes more than four million persons, or some 47 percent of the total population of the state. Clearly a district of such geographic size and population is of critical importance in the overall water management scheme in Florida.

The WMD regulates water use, surface waters, artificial recharge efforts, and permits for right-of-way occupancy and district project works and lands. The district changed its water use rules in fiscal year 1978-79 to include permitting for consumptive uses below the former threshold of 100,000 gallons per day. Individual domestic use is still excepted, as is water used exclusively for firefighting. According to the district's latest annual report, small users were heretofore neglected because of the 100,000-gallon threshold for individual permits. The new general permit rule protects the small user from a larger user if the latter threatens to disrupt or destroy the former's water supply.

Another major area of WMD activity that does not involve nearly so much time and numbers of permits, but has great potential importance, concerns deep well injection activities. Any such activity must be permitted, and the district approach to these activities is limited to experimental wells to help determine the extent to which deep well storage of potable or nonpotable water can safely be achieved. The typical permit allows an exploratory test hole for acquiring geological and hydrological data which can be analyzed and can eventually form the basis for future applications for injection well facilities.

The South Florida WMD permit process is illustrated by Figure 1. The applicant is strongly encouraged to discuss informally with the district what will be needed in the way of a completed application as early as possible. Once an application with adequate supporting information is formally submitted, a permit application for an existing project is checked by the district's field representative. Proposed projects are checked in the field upon completion to insure compliance with permit conditions. Once a formal permit is filed, there is a coordination meeting between the WMD and the state DER to insure coordination between the state and regional agency to avoid unnecessary delays for the permit applicant.

Review of the sufficiency of the data included in the permit must be accomplished within thirty days. Once the application is complete in terms of its supporting information, action must be taken within ninety days after the receipt of the application. If an application is incomplete, and additional information requested by the district is not forthcoming within sixty calendar days from the date of such a request, the application is automatically recommended to the governing board for denial. It is possible to receive an extension under certain circumstances. If the ninety-day deadline is not met, a "default permit" is issued to the applicant. It should be noted that these rules derive from the 1975 rewrite of Florida's Administrative Procedures Act, and apply to all state regulatory activities.

During the time between the receipt of adequate information to support an application and the decision on whether or not to issue the permit, a staff report is prepared. Public notice is advertised in appropriate newspapers at least fourteen days prior to the district governing board meeting at which the application will be considered. If objections by affected parties of any substance are filed in writing, a public hearing may be scheduled. In cases where public hearings are scheduled, the governing board may act as the hearing body itself. More typically, the task is assigned to a hearing officer for a quasi-jucidial hearing carried out under the Administrative Procedures Act. The governing board then receives the hearing examiner's report, including findings of fact and conclusions of law. The board is the place where final action is taken on such permit applications. Once it has acted, it is possible for an appeal from its action to be taken by an aggrieved party to the Land and Water Adjudicatory Commission, which in Florida consists of the governor and the elected cabinet.

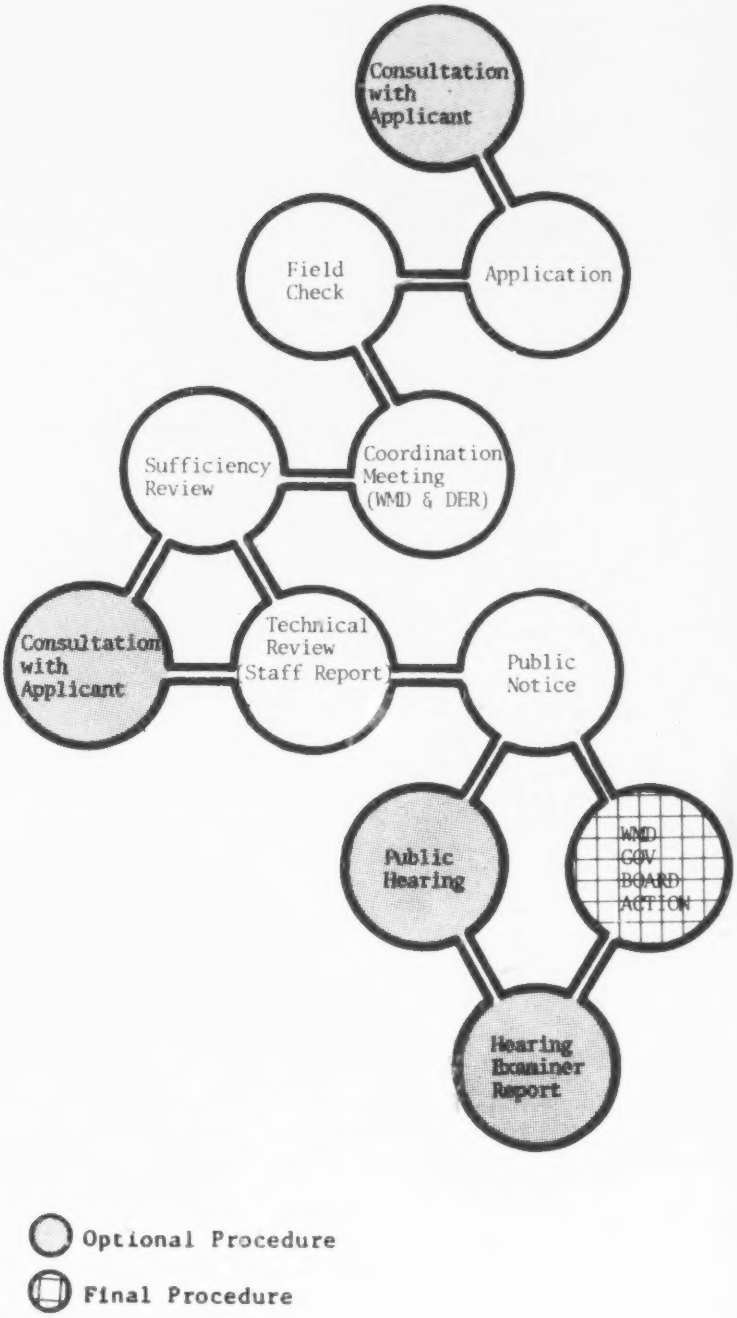
The scope of the activity involved in permitting surface and groundwater uses in the south Florida district is illustrated by the fact that from 1974 through 1976, almost 1,200 permits were acted on, including 620 water use permits, 400 surface water management permits, and 154 related right-of-way permits. In fiscal year 1978-79 alone, more than 900 permits were issued, including 376 for surface water management, 91 for combined surface water/water use, and 178 for water use including 96 for agriculture and 44 for public water supplies. There were also 265 right-of-way permits during the year.

In 1976-77, the total amount of water allocated for consumptive use permits was estimated at 728 billion gallons a year. The largest user of water was agriculture, with public water supply, industrial, mining, and recreational uses following in that order.

Criteria for the allocation of the use of groundwater are generally threefold. First, withdrawals must be judged not to adversely affect other existing users. Second, the withdrawal must be judged to be reasonable, including in the case of a public water supply or a withdrawal for a large development that the projected population for the service area is reasonable. Third, the withdrawal must be in the public interest. In addition, a water quality concern is introduced with regard to the criteria of agencies responsible for public health.

Saltwater intrusion is given special significance in the review of applications in

Figure 1.—South Florida Water Management District permitting process


Consultation with Applicant
Application
Field Check
Coordination Meeting (WMD & DER)
Sufficiency Review
Consultation with Applicant
Technical Review (Staff Report)
Public Notice
Public Hearing
WMD GOV BOARD ACTION
Hearing Examiner Report
Optional Procedure
Final Procedure

the district. This is a critical problem in some areas and especially in Broward County where eight utilities serving a great portion of the county's more than 950,000 population either currently have saltwater intrusion problems or have the potential for problems in the near future. Some twenty-nine utilities in the entire district have experienced saltwater intrusion difficulties or will experience problems should special care not be taken in the withdrawal of additional water. The Resource Control Department of the South Florida WMD is working with its Resource Planning Department to develop a computer modeling technique that will allow an accurate assessment of the impact of additional withdrawals in certain areas of the district on the saltwater intrusion problem, called the district's "most important water use problem" in the latest annual report.

Regarding surface water management, there are four basic concerns in evaluating permit applications. First, the problem of protection of structures such as buildings and roads from flooding is considered. Second, there must be an assurance that the receiving water is not subject to flows which will exceed its capacity, be it a canal, a lake, or other such area. Third, there must be assurance that the receiving water will be protected from pollution resulting from the proposed activity. Fourth, there must be evidence of the mitigation or elimination of any potential environmental damage. Typically, activities associated with surface water management permits involve either residential, agricultural, or commercial and industrial uses.

The surface water management process involves issuance of permits for all drainage activities with the exception of certain tidal waters, where DER carries out such regulation under its dredge and fill rule, and certain so-called "closed systems" exempted in the Water Resources Act. The district by rule has excepted projects with less than two acres of impervious area and less than ten acres of gross area if the local government within which the activity occurs has acceptable regulations in place and the capacity to implement them according to district criteria. For instance, certain projects in Dade County having less than forty acres of total land area are exempted under a district agreement with the county. The same is true of similar activities in Palm Beach County. In a general way, it can be said that the district is attempting to negotiate agreements with all counties which have sufficient professional staff and are willing to adopt appropriate rules so that a general permit can be issued, and the duplicating and multiple layers of permitting can be avoided.

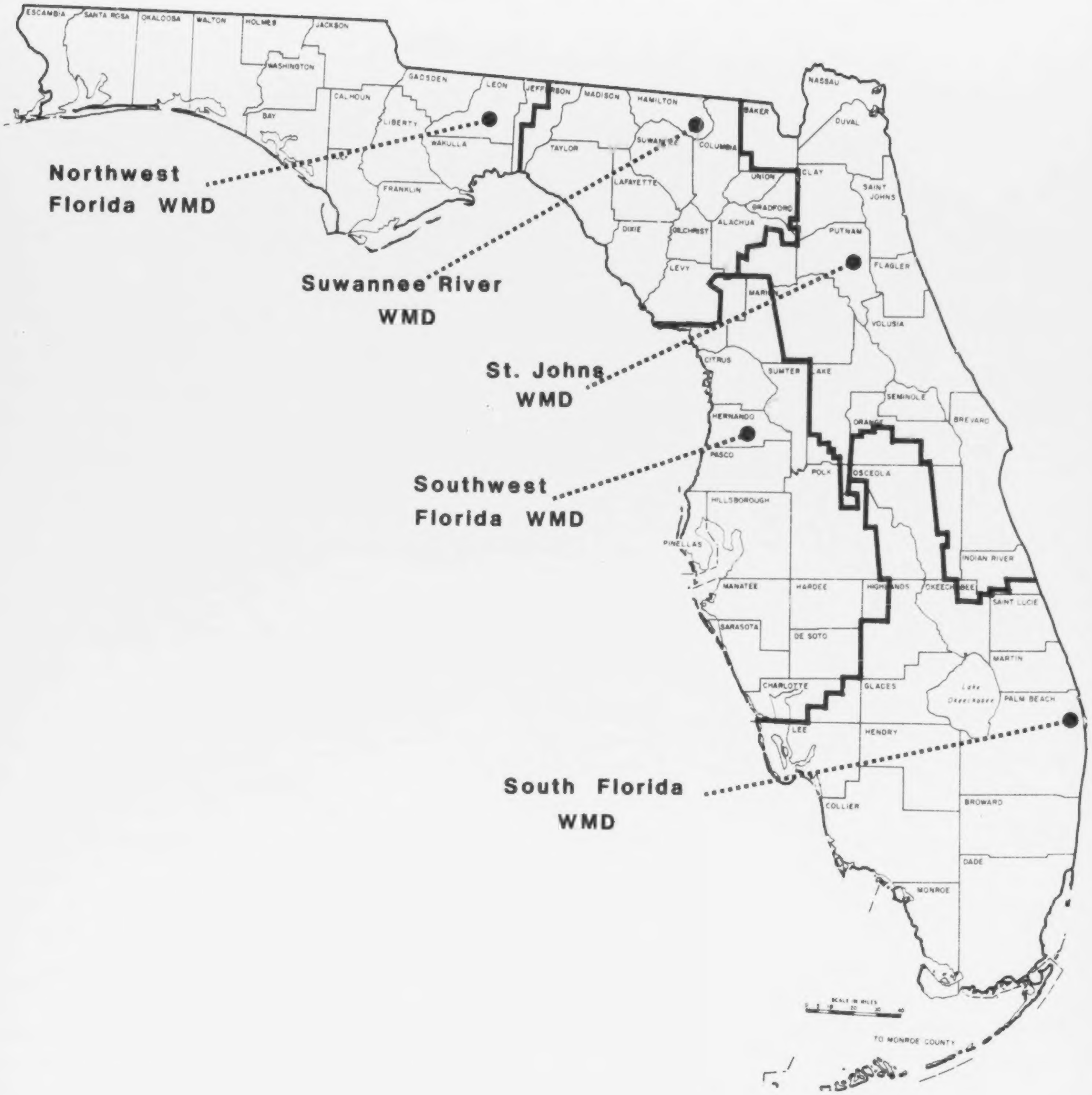
The district's activities in surface water management go well beyond its direct responsibilities under the Water Resources Act. The district performs land development reviews in cooperation with state and federal agencies, including the state DER and the U.S. Army Corps of Engineers. It participates in the 208 planning process through contracts with the local lead 208 agencies throughout much of the territory. It participates in A-95 clearinghouse reviews, and responds to environmental impact statements.

Another area in which the district carries out very important water management activities is through participation in development of regional impact (DRI) reviews under the Environmental Land and Water Management Act adopted in Florida at the same time that the Water Resources Act was approved by the legislature. This act provides for a regional assessment of large projects such as housing developments, shopping centers, airports, electrical transmission lines, port facilities, petroleum storage, and others. The district, under contract with the several regional planning councils in its territory, carries out the water quantity, water quality, and natural vegetation elements of the DRI review.

With regard to permit administration, the Permit Administration Division has prime responsibility in assisting the other divisions of the Resource Control Department in issuing permits. It also monitors the implementation of the permitting process to assure that the stipulations involved in permits, often major conditions which are attached before a permit will be approved, are actually carried out in the field.

While the activities of the South Florida WMD are not typical of the newer districts located in the more rural areas of the state, they are very close to the nature and scope of the activities carried out by the Southwest Florida WMD in the Tampa Bay area, and the scope of activities with which the St. Johns River WMD will increasingly be involved.

Figure 2.—Florida water management districts


Northwest Florida WMD
Suwannee River WMD
St. Johns WMD
Southwest Florida WMD
South Florida WMD
ESCAMBIA
SANTA ROSA
OKALOOSA
WALTON
HOLMES
JACKSON
WASHINGTON
BAY
CALHOUN
GADSDEN
LIBERTY
LEON
WAKULLA
FRANKLIN
JEFFERSON
MADISON
HAMILTON
TAYLOR
SUWANNEE
COLUMBIA
LAFAYETTE
DIXIE
GILCHRIST
ALACHUA
LEVY
BAKER
UNION
BRADFORD
NASSAU
DUVAL
CLAY
SAINT JOHNS
PUTNAM
FLAGLER
MARION
VOLUSIA
CITRUS
SUMTER
LAKE
SEMINOLE
HERNANDO
PASCO
ORANGE
BREVARD
POLK
OSCEOLA
HILLSBOROUGH
PINELLAS
INDIAN RIVER
MANATEE
HARDEE
HIGHLANDS
OKEECHOBEE
SAINT LUCIE
SARASOTA
DE SOTO
MARTIN
CHARLOTTE
GLADES
Lake Okeechobee
PALM BEACH
LEE
HENDRY
COLLIER
BROWARD
DADE
MONROE
TO MONROE COUNTY
SCALE IN MILES

IN EACH DISTRICT, SPECIAL PROBLEMS

Comments on various problems within each water management district were gathered in the course of telephone conversations by Robbie Aiken, student in the University of Florida College of Journalism and Communications, with spokesmen from each district.

NORTHWEST FLORIDA WMD—William McCartney, executive director, Tallahassee

ESTABLISHING SAFE MINIMUM FLOWS AND WATER TABLE LEVELS

"This is a pressing problem. It's crucial. Maybe it will take ten to twenty years to complete the table levels. Frankly speaking, we need more funds. Last year the WMDs asked for fifty million dollars and received only four million from the legislature."

BALANCING ENVIRONMENTAL LOSSES AND ECONOMIC BENEFITS

"A total integration is needed of environmental and economic issues. In the seventies, the environmental issues were prevailing and now there is a swing back in the other direction. The policy makers and the private sector need to work together."

SITE-SPECIFIC ENVIRONMENTAL REGULATION

"I think environmental regulation has to be on a case-by-case basis. That is the beauty of the WMD. We get down to each problem or condition that exists in the district. There is no statewide blanket."

ST. JOHNS WMD—Tommy Clay, acting executive director, Palatka

WATER TRANSFERS FROM NORTH TO SOUTH

"As of now I don't see any pipelines being built to take any water out of our district and moving it to the south. As of now we can't give statements until we know all the circumstances."

EVAPOTRANSPIRATION LOSSES

"Salt water intrusion is the main cause of this problem. There has also been excessive pumping which has caused us problems. We have no field data on evapotranspiration losses."

WATER SUPPLY AUGMENTATION

"We have water shortages in the coastal parts of our district, but one of our goals is to improve the water situation in those areas by putting water back in the St. Johns River upstream."

SUWANNEE RIVER WMD—Don Morgan, executive director, White Springs

MEASURING AGRICULTURAL WATER USE

"We have just published a manual on how to meter water use and we've received very positive feedback on it. It think we got way out front on this, primarily because agriculture is the largest user in our district. The manual shows everything from how to put in timers on the wells to how the pumps are operated."

WATER TRANSFERS FROM NORTH TO SOUTH

"I'm not only opposed to the entire concept of a transfer but, more, I don't believe there is enough water up here to send a large quantity to south Florida or anywhere else. We have determined that it would be devastating to move water out of the Suwannee. We are opposed to any movement of water from the Suwannee and will fight it to the end."

PRESERVATION OF THE SUWANNEE RIVER

"This river cannot survive without additional controls. There are no restrictions on builders now and eventually they or the homeowners are going to be underwater. As soon as that happens, they are going to go screaming to the politicians to save them from the water, which will result in a dam being built. Things are fine now but later on things will get bad and the river will go down the tubes. Or, eventually, septic tanks will begin to ruin the water. You can only put so much junk in the water before it gets screwed up."

BALANCING ENVIRONMENTAL LOSSES AND ECONOMIC BENEFITS

"Environmental considerations are so complex that it's too difficult to put a dollar figure on them. I think we have underestimated the problem over the last ten years."

SITE-SPECIFIC ENVIRONMENTAL REGULATION

"No, I think some consequences of the projects are different statewide. We have regional developments and regional problems with our projects. One of the problems is the difference between surface water and groundwater. Contamination to surface water in one area can affect groundwater miles away in another district."

MANAGING LEACHATE FROM LANDFILLS

"Leachate is a problem in our area . . . a high degree of it because of sinkholes. Unfortunately the push isn't there yet to do anything about it. As soon as someone gets sick, or people start finding dead fish on the banks of streams and lakes, then it will motivate people enough to call for action."

SOUTHWEST FLORIDA WMD—Bob Atcheson, public information officer, Brooksville (Donald Feaster, executive coordinator)

REDUCTION OF WATER USE IN PHOSPHATE INDUSTRY

"We now let industry reuse water which has been treated. Fifty thousand gallons of treated water is being dumped into Tampa Bay every day. As soon as the psychological problems of using water pass, people will be able to use the water without any problems. We've already cleared its use for industry."

FLOOD PLAIN ORDINANCES

"Very definitely needed. We have made recommendations to the county commission for an advanced system. I hope they will follow our recommendations."

SOUTH FLORIDA WMD—John Wodraska, assistant director, West Palm Beach (John R. Maloy, executive director)

MEASURING AGRICULTURAL WATER USE

"We haven't done any metering but we do have reporting requirements. We know that when there is a shortage we will need to implement a system right away. But we haven't worked out a compromise yet with the farmers."

MANAGING STORMWATER DETENTION PONDS

"We are focusing on new urban construction. We think that's where the problems are. There isn't a whole lot we can do about the wells that have already gone down. We are concentrating on the future in the new and developing areas so we can make sure they are put in right."

MULTIPLE-PURPOSE USE OF WATER CONSERVATION AREAS

"We have had our problems in this area for sure. Two different groups have taken us to court to force us to change the water level in two conservation areas. In one area, the Friends of the Everglades want the water level raised so they can take their air boats through the area and the other group wants the water lowered so deer will move freely in the area for hunting purposes. The WMD has to worry about the area for different reasons than these groups. As far as we are concerned the area is designated a water conservation area for the purpose of storing water for Fort Lauderdale."

BALANCING ENVIRONMENTAL LOSSES AND ECONOMIC BENEFITS

"We've become skilled in environmental practices. The legislature now understands that an economic study is needed as well as an environmental impact study on any new development project. I think the environmental movement has been going strong for years and now the economic movement is picking up steam over the last five to eight years. People are beginning to be more interested in making money. We need to strike a balance.

Legal Principles of Water Management

Frank E. Maloney

Professor of Law
and Dean Emeritus
Holland Law Center
University of Florida

This article is a restatement in considerably less technical form of the lead article in the Florida Bar Continuing Legal Education publication. Environmental Regulation and Litigation in Florida, *1979 edition. Readers desiring detailed documentation of the statements contained herein are referred to that article and its very complete footnotes. The assistance of Andrew Thomas, a 1979 graduate of the Holland Law Center, in updating and condensing the original is gratefully acknowledged by the author*

The water law of the State of Florida has developed within the Anglo-American legal system passed on to the United States from Great Britain. Within a country as large and diverse as the United States, with tremendous variations in the quantities of available fresh water, it is not surprising that different systems of regulating water use should have developed. While the United States, viewed in its entirety, has a bountiful supply of water, only the eastern and particularly the southeastern portion, including Florida, has been blessed with an ample annual rainfall.

Riparian developments

As the United States developed, the more humid East found variations of what became known as the "riparian" system of water law suitable to its early needs, whereas the arid West developed the system of water law known as prior appropriation.

The riparian system was based on ownership of land touching the bank of a watercourse, including both lakes and streams. The owners of such land were referred to as riparian owners. In its earlier stages, the system largely ignored groundwater, as did the western prior appropriation system. The interrelationship of ground and surface water as parts of the same hydrologic cycle was not yet appreciated.

. . . . the question, "What is the best use?" . . . lies at the heart of sound long-range planning for optimum water resources development in the public interest . . . .

In those states that followed the original version of riparianism, known as the natural flow doctrine, the lower riparian owner was entitled to substantially the full flow of a watercourse in which he had riparian rights. This in turn meant an upper riparian owner could not alter the natural flow of the watercourse except for purely domestic purposes. The natural flow doctrine was adopted in England and the eastern United States when the consumptive use of water for industry and irrigation was very minor and when the predominant problem was the prevention of pollution. It has been modified in many eastern jurisdictions by what is known as the "reasonable use" doctrine, under which a lower riparian owner is entitled to protection only when diversion by an upper riparian owner unreasonably interferes with his use of the water. This in theory permits full use of the available supply, allowing each riparian owner to make beneficial use of the water for any purpose to the extent that his use does not unreasonably interfere with the beneficial uses of others.

Florida

Prior appropriation

A different system of water rights law developed in the West. Western law had its inception in the needs of the early gold miners for large quantities of water. The water was first "appropriated," sometimes at gunpoint; later the developing law of the West granted judicial recognition to these appropriations. Under this doctrine, riparian ownership is not essential to the right to make withdrawals. A riparian or other owner can appropriate in perpetuity the right to use as much water as he can successfully divert and beneficially employ, as long as his appropriation is prior to that of others, in which case his right, on a "first come, first served" basis, may extend in an extreme case to the complete appropriation of the available supply.

Contrasting the systems

The right to obtain water from a watercourse comes automatically with ownership of land under the eastern riparian doctrine. The western states, following the appropriative system, all provide a formal means for acquiring water rights through some type of permit system. The predominant feature of the prior appropriation system is that a riparian or other owner can appropriate, in perpetuity, the right to use as much water as he can successfully divert and beneficially employ as long as he does so prior to other users. This right of use may be lost only through abandonment and forfeiture.

In contrast, the riparian doctrine has never recognized an unqualified right in any person to the use of a specified quantity of water at a given time for a particular purpose; the right has always been dependent on the circumstances existing at any given time. In riparian jurisdictions the property interest of riparian owners is a right to make use of the water under a system of reciprocal rights. The system may change, as long as the change is pursued in a reasonable and just manner, in the public interest, and does not inequitably disturb the reasonable expectations of those with the right to make use of water.

In the past, because there was an ample supply of water, the common law standard of relative reasonableness under the reasonable-use rule sufficed for adjustment of conflicts between users in the eastern United States. At the same time, the riparian reasonable-use rule provided a much more flexible system for allocation and reallocation of water resources than the appropriation-in-perpetuity approach of the western system.

Post-World War II developments

Technological developments and industrial expansion stemming in large part from World War II led to ever-increasing demands on the water resources of the eastern United States. As these demands increased, the reasonable-use doctrine administered by the courts began to prove inadequate to meet them.

To meet various criticisms, the Model Water Use Act was drafted by the Legislative Research Center at the University of Michigan Law School after extensive studies and was approved in 1958 by the National Conference of Commissioners on Uniform State Laws. In general, it contemplated the creation of a state water resources agency and the issuance of permits for some definite period of time, fifty years being the suggested maximum. It also provided for the exemption of domestic uses and for preservation of other existing uses. It was enacted only in Hawaii, and there only with respect to groundwater.

This model, however, aided a number of eastern states in rethinking their water use laws. A number of them established state water resources agencies to aid in the

development of permit systems regulating all or a part of the water resources of the particular state. At the same time, a number of eastern states considered switching from riparianism to prior appropriation. At least nine states, including Florida, considered and rejected it. Their reasons included a reluctance to suddenly give prior users in the East, simply on the basis of then existing uses, the right to use the water in perpetuity, thus surrendering in large part to the marketplace the long-range planning functions which are a duty of government. They preferred, through the development of permit systems providing for permits of finite duration, to ensure a reevaluation at periodic intervals of the beneficial character of the permitted use.

Increasing concern for environmental protection, as reflected in the maintenance of minimum stream flows and groundwater level, was another factor in their rejection of prior appropriation. Most western water rights systems were designed to promote economic development of the land. If this resulted in depletion of streams and interference with instream values, including recreational use and propagation and maintenance of fish and wildlife resources, and depletion of related groundwater resources, it was viewed simply as a necessary price to be paid for the economic development associated with making more water available for irrigation. Utilization, rather than conservation, was the guiding principle. This led one group of eastern authors to conclude that prior appropriation contributes nothing toward answering the question, "What is the best use?"[1]—a question that lies at the heart of sound long-range planning for optimum water resources development in the public interest.

Development of the Florida system

While tentative steps toward the development of permit systems with permits of limited duration were being taken in other eastern states, some interesting developments were also occurring in Florida. Before World War II, the major emphasis was on drainage to dispose of excess surface water, particularly in the rapidly developing agricultural areas of south Florida. The topography of this area is very flat, and rainfall often remained on the land for long periods unless it was removed by drainage works. In the earlier period primary, and indeed often sole, emphasis was placed on the construction of these works. Single-purpose drainage districts, including the large Everglades Drainage District, and hundreds of smaller drainage districts were formed with little thought other than to remove the surface water from the land. The same development began to take place in central Florida, where the Green Swamp, which provided one of the major recharge areas for the Floridan aquifer in that part of the state, was being rapidly drained.

But much of Florida is subject to lengthy periods of severe rainfall deficiency. At such times the surface water which was being wasted into the sea through drainage works could have been much better used for irrigation and groundwater recharge.

One result was the formation in 1949 of the Central and Southern Florida Flood Control District as a multipurpose water management district in which conservation and use of diffused surface water rapidly became of equal importance to its disposition in periods of excess rainfall.

In 1961 the Southwest Florida Water Management District, which covers another fifth of the state, was created. As in the case of the Central and Southern District, conservation of water supplies quickly became one of the principal projects of the district. Moreover, observation of the lack of adequate authority to regulate groundwater in the Central and Southern District led the legislature to grant such authority to the Southwest District where regulation of groundwater resources was relatively more critical than in the Central and Southern District.

Meanwhile, following the state's rejection of a proposed statewide switch from common law riparianism to prior appropriation, the Florida Legislature and water law experts at the University of Florida began to examine the possibilities for establishing a workable regulatory system for Florida, using the riparian system as its starting point. These studies led first to the enactment of the 1957 Florida Water Resources Act, establishing a statewide administrative agency to oversee the development of Florida's water resources. The agency, originally established as a division within the State Board of Conservation, was authorized to issue permits for the capture and use of excess surface and groundwater, and to establish rules for the conservation of water in areas of the state where overwithdrawals were endangering the resource through saltwater intrusion or other causes.

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[1] *See H. Ellis, J. Beuscher, C. Howard & V. DeBraal, Water-Use Law and Administration in Wisconsin, §20.01(b) (1970).*

Florida's 1972 Water Resources Act

Building on the somewhat modest beginning described above, a group of water law experts at the Holland Law Center of the University of Florida developed "A Model Water Code."[2] It was designed to provide a vehicle for comprehensive state regulation of Florida's water resources along hydrologically sound lines, taking into consideration the interrelationship of all types of water resources in the hydrologic cycle. It provides for a system of administrative regulation within the framework of a riparian water law system. It was published in book form by the University of Florida Press, and its essential chapters were adopted in Florida as the Water Resources Act of 1972, now Chapter 373, Florida Statutes (1973).

Florida's 1972 Water Resources Act provides for a two-tiered administrative structure headed at the state level by what is now the Department of Environmental Regulation. Under the department are five regional water management districts (WMDs) designed to provide the diverse types of regulation necessary in different areas of the state.

Since the Central and Southern (renamed South Florida) and the Southwest Districts were already in existence, fully staffed, and authorized to levy ad valorem taxes to pay for their regulatory functions, they were promptly delegated full regulatory and permitting powers by the Department of Natural Resources, at that time the state-level regulatory agency. The act gives discretionary authority to the department to determine on behalf of the state when permit requirements should be imposed in the various districts. While the remaining three districts, located in the northern part of Florida, have been delegated permitting authority, only the St. Johns River Water Management District has begun implementation of a permitting program. The need for regulation in these districts has been considered less crucial, but budgetary problems appear to be the primary reason for the lack of permitting programs.

The Florida system in action

One of the most important features of Florida's 1972 Water Resources Act is its requirement for the development of an overall state water plan to be composed of a state water use plan and a state water quality plan. The latter is to be composed of water quality standards, objectives, and guidelines, and requires a specific program of implementation for those water uses which do not presently meet established water quality standards. It is to be married to the state water use plan by the Department of Environmental Regulation, which today has statewide jurisdiction over water use and water quality planning and regulation. The product of this marriage will be the state water plan.

The Florida act differs from most state statutes in that it directs the department to prepare a specific document containing a detailed and comprehensive blueprint for water resources management within the state. Because the state water use plan must be formulated on an area-by-area basis, the water management districts must of necessity play a prominent role in the development of the plan. The act directs the governing boards of the districts to cooperate with the department in this respect and furnish necessary technical information and services.

It is essential that the governing boards participate actively in the formulation of the state water use plan since they will play a major part in the implementation of its objectives. They are the agencies which will administer the various permit systems, thus regulating consumptive uses of water, as well as issuing permits for the construction or alteration of dams or other water storage structures for surface water management, and for the construction and operation of wells for withdrawal or recharge of groundwater.

To this end the Florida Water Resources Act delineates general objectives that the state water use plan must seek to implement. The Department of Environmental Regulation is required to give due consideration to:

1. the attainment of maximum reasonable-beneficial use of water for

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[2] F. Maloney, R. Ausness, & S. Morris, A Model Water Code, University of Florida Press, 1972.

environmental protection, fish and wildlife, recreational use, water quality, irrigation, mining, power development, domestic, municipal, and industrial uses;

2. economic development of water resources;
3. control of waters for purposes of navigation, drainage, and flood control;
4. the quantity of water available for application to a reasonable-beneficial use;
5. the prevention of wasteful and unreasonable use of water resources;
6. presently exercised domestic use and permit rights;
7. water quality and the state water quality plan;
8. the state water resources policy.

Detailed planning must be based on a thorough study of the state's water resources, including existing water use patterns and problems.

The state water use plan is to be formulated as a functional element of the comprehensive state plan. The state water plan should, therefore, be consistent with whatever land use plans are developed at the state level. Its adoption will mark a milestone in water resources management in Florida and complete a major step in the planning process initiated under Chapter 373, Florida Statutes. Unfortunately, the present status of the Phase I plan is still tentative.

A more effective law for the development and implementation of land use planning in Florida is the Local Government Comprehensive Planning Act of 1975. Among required elements of local government comprehensive plans are projection of needs for drainage and potable water and the correlation of these needs with the land use element; consideration of the problem of how to provide the necessary facilities for such drainage and water supply; and analysis of the conservation, development, utilization, and protection of natural resources in the area.

Although the act does not mandate in any way the substance of the decisions made by local planners, it does make them consider interrelated effects. Furthermore, the comprehensive local plan has a powerful legal status. All land development regulations and subsequent land developments must be consistent with the comprehensive plan.

The state's only direct involvement with land use control other than as it relates to state action is through the Environmental Land and Water Management Act of 1972. It is closely modeled after the American Law Institute's (ALI) Model Land Development Code. A basic premise of the act is that the state should become involved with only a small number of land use decisions—those with regional or statewide impacts.

Florida's governor and cabinet are empowered to designate lands as areas of critical state concern. Three types of areas may be so designated: areas containing, or having a significant impact upon, environmental, historical, natural, or archaeological resources of regional or statewide importance; areas affecting or affected by major existing or proposed public facilities, such as airports or roads; proposed sites for new communities. A serious limitation is that no more than 5 percent of the state's land area may be designated at any one time. The Administration Commission must then specify principles for guiding development of the area. Local land development regulations must be consistent with those principles.

Developments of regional impact are also subject to specific regulation. The procedure essentially subjects such developments to state review. The right to evaluate and approve proposed developments, at least initially, remains in local government. Regional planning councils have a right to make recommendations. There is no requirement that these recommendations be followed, but if a development order is issued then either the developer, the regional planning council, or the state land planning agency may appeal the order to the governor and cabinet. A final decision on whether to allow development is then made by that statewide body.

The Environmental Land and Water Management Act has been a very important tool for protecting Florida's water resources. The first areas of critical state concern, Big Cypress and Green Swamp, were designated largely to protect them as sources of ground and surface water.

Water use planning and management considerations have also played a determinative role in the evaluation of developments of regional impact. In the first such case decided on appeal by the cabinet, permission was denied for a large residential development near Orlando in large part because of concern for the effects of sewage and stormwater runoff on water quality of the adjacent Wekiva River.

A more recent example of the development of regional impact process is the "Estuaries," a proposed development of regional impact in Lee County adjacent to Estero Bay on the southern Gulf coast of Florida. The developer proposed to develop a 6,500-acre tract of land with 26,500 high density dwelling units. In its evaluation recommending disapproval of the project, the Southwest Florida Regional Planning Council concentrated heavily on potential harmful impacts to the water quality of the adjacent estuaries.

Another impact evaluated by the council was the proposed development's demand on the area's freshwater supplies. It concluded that insufficient data existed to determine whether the project would unduly burden areawide water resources. Based on the negative recommendation, the Lee County Board of County Commissioners refused to issue a favorable development order. A state-appointed hearing examiner recommended upholding that decision, and the state cabinet, sitting as the State Land and Water Adjudicatory Commission, upheld denial of the development order. The First District Court of Appeal of Florida reversed the denial, and that reversal is currently on appeal to the Supreme Court of Florida.

Consumptive water use permits

Returning to the 1972 Florida Water Resources Act, an innovative provision in the act is the provision of a new standard to govern the issuance of consumptive use permits—the standard of reasonable-beneficial use.[3] This standard is designed to protect other water users and the general public from wasteful uses of water. First of all, it allows only that quantity of water to be used as is necessary for an economically efficient operation. However, the reasonable-beneficial use standard also requires that the water, regardless of amount, be used for a purpose which is both reasonable and consistent with the public interest.

One device which the Department of Environmental Regulation can use to bring about closer integration of water management decisions with those of local land use planners would be through defining the public interest component of the reasonable-beneficial use standard in the state water plan. Permitting use of water for an activity that is inconsistent with local land use plans, even if they have not yet been implemented in local regulations, could then be found contrary to the public interest. For example, if county planners have decided it would be desirable to preserve a certain area in its natural state or as an agricultural zone, it would not be in the public interest for the water management district to grant a consumptive water use permit for the potable water supply of a large residential development in the area. Rather than granting the permit simply because water is physically available, a water management district could deny it to reinforce the efforts of local land use planners.

Another feature of the 1972 Florida Water Resources Act could be used by Florida's water managers to harmonize the issuance of permits with land use plans. The Department of Environmental Regulation is allowed to designate in the state water use plan certain desirable uses which are to be given a preference in the granting of consumptive use permits. Such uses might include recreation, preservation of the environment, protection of recharge areas, and others. A general preference for those uses which are consistent with land use plans over those uses which are inconsistent might also be stated. Once such a designation is made, the governing boards of the water management districts must recognize it.

Recognition of environmental considerations

The Florida Water Resources Act also provides for the establishment of a minimum flow for surface watercourses, as well as minimum lake and groundwater levels. It is essential that any system of water allocation include provisions for minimum flows and levels for public purposes. Commercial navigation, recreational boating, fishing, hunting, swimming, and protection of the ecology are some of the nonconsumptive

[3] *For detailed discussion and analysis of this standard, which lies at the heart of the 1972 Florida Water Resources Act, see Maloney, Capehart and Hoofman,* Florida's "Reasonable-Beneficial" Water Use Standard: Have East and West Met? *31 University of Florida Law Review 253 (1979)*

public purposes that can be protected under the minimum flow and level concept. For groundwater, the minimum level is defined as the level of water in an aquifer at which further withdrawals would be significantly harmful to the water resources of the area. The water management districts are allowed to calculate minimum flows and levels to reflect seasonal variations. Thus minimum flows and levels act as guidelines in the granting of permit rights and also protect nonconsumptive uses and allow protection of recharge areas and the furtherance of other environmental objectives. Minimum flows and levels have been developed thus far by applying a standard formula to all water resources. These objective formulae have been criticized as being inadequate to properly conserve and protect the water resources of Florida. The water management districts should evaluate the effectiveness of their present guidelines and amend them as necessary, giving consideration to employing specific methods of biologial monitoring.

> ***.... the provisions in the (Florida Water Resources) Act for handling shortages and emergencies are . . . innovative . . . .***

Florida's Water Resources Act also permits a form of "environmental zoning," as certain uses may be declared undesirable because of the likelihood that they will adversely affect the environment in the surrounding area. In such cases the governing board of a water management district is authorized, but not compelled, to deny a consumptive use permit.

Provision for water shortages and emergencies

The provisions in the Florida act for handling water shortages and emergencies are also innovative. The act requires that the governing board of each district formulate a water shortage plan, as part of which a system of permit classifications is to be established. The district may declare a water shortage when insufficient water is available to meet the requirements of the regular permit system or when conditions are such as to require temporary reduction to protect the area's water resources from serious harm. The governing board of the department may impose restrictions on all or specific classes of permits to protect or restore the water resources.

In the event of a more severe shortage, the board may declare a water emergency and issue orders requiring apportioning, rotating, limiting or even prohibiting certain uses where necessary to meet the emergency. An affected party must obey the order, but the board must provide him with a hearing within fifteen days in the event he believes he has been treated unfairly.

The system provides definite guidelines to facilitate advance planning for periods of water shortage along with a fair and equitable method for users to share the available water at such times. The first step toward such planning is a system of classification, after which the board is required to formulate a plan for use during any future periods of shortage. Restrictions on water use will then be applied on a class basis, and individual users will know in advance their relative priority in time of shortage.

Under the Florida act, each permittee is entitled to his full amount of water until a shortage is declared. Notice and public hearing are required before such a declaration is made. It should be emphasized that such a crisis is an emergency only in the sense that the water supply is critically deficient. It should occasion no sudden surprise. Because of the plan, all concerned will know what is to happen, when it is to happen, and what to expect at each stage of the crisis. The water shortage plan provides a mechanism for orderly adjustment of consumptive uses in periods of shortage, thereby mitigating in the long run the effects of such a situation.

How is this device working out in practice? The South Florida Water Management District has classified its permits according to source and use for the purpose of implementing water shortage plans within the district. The source classification includes ground and surface water, with the provision that the board may further classify these sources if necessary. Uses have been classified into nine groups—domestic, essential service, public

. . . . one of the foremost planning tools for sound water resource management is regulation of consumptive uses and reallocation of water to more productive uses . . . .

supply, livestock, agricultural, industrial, mining, power, and recreational—with provisions for further classification if deemed necessary. No specific classification for preservation of natural resources or fish and wildlife was made since these are not uses that require permits, but the district has indicated its intention to protect these resources under other provisions of the act establishing minimum flows and levels.

The listing of the classes in district regulations did not establish a priority ranking between classes. This problem was left for further refinement through the development of area water shortage plans to be adopted and promulgated by the board after public hearings in the areas concerned. Two such area plans have been adopted to date, one for the Lake Istokpoga-Indian Prairie Area, and one for the Saint Lucie County Agricultural Area. The district appears to have established a workable method for dealing with water shortages and has provided a reasonable and equitable system for handling such shortage situations in the public interest. Unfortunately, the other water management districts have not yet seen fit to implement this part of the Florida Water Resources Act although mandated to do so when the act was adopted in 1972.

Applicable law in districts without consumptive use permit programs

Withdrawals

Although, as explained above, the 1972 Florida Water Resources Act was taken from the "Model Water Code," a number of the provisions of the model code were changed or omitted by the legislature. For example, the model code envisioned a mandatory permit system for withdrawals of water for consumptive use, but the legislature changed this requirement to authorize rather than require such a system.

Once the permit system becomes operative in a particular water management district, it is mandatory that it be followed, but the provisions of the statute with respect to such a system do not come into play until the program itself is adopted. This is the present status of the law in the Suwannee River and Northwest Florida Water Management Districts where no permit programs have been implemented, and in the St. Johns River WMD where only a part of the district has a permit program. In these areas the common law rules respecting water allocation are still a vital element of water law in Florida.

With respect to surface water, the common law rule developed by the Florida courts allows riparian owners to make reasonable uses of the water, so long as those uses do not unreasonably interfere with the reasonable uses, actual or prospective, of the other riparian owners on the watercourse.

With respect to groundwater, Florida has adopted the reasonable use approach rather than the English common law in its pure form under which the ownership of land carried with it the absolute ownership of the water below it. In *Koch v. Wick*[4], a leading 1956 Florida case, the Supreme Court of Florida clearly rejected the absolute ownership rule, and indicated it would follow the reasonable-use rule in matters concerning groundwaters.

This rule, as applied to the regulation of groundwater in most reasonable-use jurisdictions, differs somewhat from the rule applied to use of surface water. As to the latter, it would be unreasonable for one riparian to take all of the water, even if he could put it to beneficial use. If there were other riparians seeking to share in the use of the water, they would all have equal rights to make use of it. Under the rule for groundwater as developed in eastern jurisdictions, however, reasonable use has focused on the relationship of the use to the overlying land. Courts have allowed uses for irrigation and manufacturing to stand as reasonable even though they adversely interfered with the rights of other users because the use of the water was beneficial to the land of the user.

Transportation of water

There is a limitation applied in the common law that may be of considerable importance in those areas of Florida where con-

[4] *87 Southern Reporter 2d 47 (1956)*

sumptive use permit systems have not yet been implemented. That is the restriction that water from watercourses is not to be used or transported beyond riparian land, and groundwater is not to be transported beyond the overlying land of the landowner.

The existence of this often overrestrictive limitation was one of the principal factors leading to the creation of the Florida Water Resources Study Commission by the 1955 legislature and to the provision in the 1957 Florida Water Resources Law authorizing permits for the capture, storage, and division of surface and groundwater in excess of the reasonable needs of riparian and overlying landowners. This legislative authority was designed to implement a dictum in the 1927 Florida case of *Tilden v. Smith*[5] which approved the diversion of excess flood waters from surface watercourses. It was repealed concurrently with the enactment of the 1972 Florida Water Resources Law. The 1957 permit system for excess water was replaced with even broader authority for water management districts to authorize divsions beyond riparian and overlying land once those districts sought and received permitting authority under the 1972 act.

In those water management districts that have not yet received that authority, it would appear that the common law rule against diversions beyond riparian and overlying land may well remain in full force and effect. Such illegality would arguably render the use per se unreasonable and subject the user to the possibility of injunctive restriction as well as to liability for damages as a result of the use. The complainant, however, would have to prove that he was injured by the unreasonable use as a prerequisite to obtaining either damages or injunctive relief. In *Koch*, the complainant was denied relief against Pinellas County, which was withdrawing water from land adjacent to his land and transporting it to the City of Clearwater. As the case clearly indicates, relief was denied only because the plaintiff failed to show damages. Expert testimony of qualified hydrologists on such matters is more readily obtained today, and if available should overcome this difficulty.

This section of the discussion cannot be concluded without reference to a case currently on petition for review by the United States Supreme Court. If the opinion of the trial court should be reinstated, the case could have the effect of superimposing the older common law rules with respect to consumptive use of water as restrictions on the permit system provided by the 1972 Florida Water Resources Act in those water management districts which have already implemented their consumptive use permit systems.

The case is *Jupiter Inlet Corporation v. Village of Tequesta.*[6] Appellant, Jupiter, owned land on which it planned to build condominium apartments. Pumping by Tequesta from a wellfield near Jupiter's property depleted the fresh water in the shallow aquifer in the vicinity of the wells and resulted in saltwater intrusion under Jupiter's land. Jupiter, which alleged it had intended to use the shallow aquifer as a source of potable water for its condominium apartments, brought suit against Tequesta on the theory that Tequesta's actions constituted a taking of Jupiter's property. On appeal from a summary judgment for Tequesta entered by the Circuit Court for Palm Beach County, the District Court of Appeal, Fourth District, reversed, finding that the shallow aquifer beneath Jupiter's land was a type of private property, the beneficial use of which could not be divested without payment of full compensation. The case was certified to the Supreme Court of Florida, the question being whether such deprivation of beneficial use of the aquifer was a taking by the governmental unit.

If the Supreme Court of Florida had upheld the District Court's opinion, the result would have gone beyond recognition of existing uses of water which are protected under the Water Resources Act, provided that permits to continue such uses have been applied for within two years of the implementation of the permit systems in the area. Such a decision would have extended the common law right to make future use of underlying groundwater to districts which had already implemented their permit systems, regardless of whether the district had received an application and found such use to be a reasonable-beneficial one. Such an interpretation would have gone far toward emasculating the 1972 Water Resources Act.

The Supreme Court of Florida did not uphold the District Court. Instead the court held: (1) prior to the 1972 Water Resources Act, Florida followed the reasonable use rule; (2) there is no ownership in the waters below land since a landowner's right is to the use of the water and not the water itself; (3) in applying the reasonable use rule, the Florida courts had not given definite answers to the actual amount of water that may be taken by overlying landowners; (4) the diversion of water from the shallow-water aquifer is not a "taking" or an appropriation of property for public use unless there is resulting damage to the land itself; (5) the landowner does not have a constitutionally protected property right in the water beneath the property; (6) legislation may limit or regulate the right to the use of water (similar to zoning regulations), which the 1977 Florida Water Resources Act does, replacing the ad hoc judicial determination in districts where consumptive use permitting is in force; and (7) Jupiter's only remedy is through proper application for a permit under the 1972 Florida Water Resources Act. Therefore, Tequesta was not liable to Jupiter for a "taking" of property for a public purpose and not required to pay damages.

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[5] *113 Southern Reporter 708, 711 (1927)*

[6] *371 Southern Reporter 2d 673 (1979)*

In essence, this case has given legitimacy to the 1972 Water Resources Act by making it clear that the common law has been replaced in areas where consumptive use permitting has been implemented. The final resolution of this case by the United States Supreme Court is indeed a matter of great public interest, since it will be the key to whether the Florida legislature has provided a workable system for regulating the consumptive use of water in this state.

Conclusion

The technological advances brought by World War II, plus the population explosion that followed, have made it evident that overreliance on market forces to allocate land and water use has become obsolete, if not dangerous. As demands for their use have escalated, it is finally becoming recognized in the United States that both land and water are finite resources. Moreover, man has developed the technological capability of destroying these resources beyond the capacity of nature to repair.

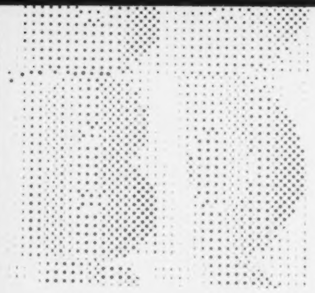
One of the foremost planning tools for sound water resource management is regulation of consumptive uses and reallocation of water to more productive uses. A system of consumptive water use permits of finite duration, coordinated with a program of comprehensive planning for both land and water use, is the most effective means of implementing sound planning objectives and directing development along planned lines. Landmark Florida laws of the past decade, including the 1972 Water Resources Act, provide workable means for accomplishing this end.

> ***There . . . remains the need for better coordination of land and water use planning and regulation if the public interest is to be fully served. Unfortunately, Florida depends on essentially separate regulatory systems for land and water . . . .***

There still remains, however, the need for better coordination of land and water use planning and regulation if the public interest is to be fully served. Unfortunately, Florida depends on essentially separate regulatory systems for land and water. Land development is regulated by a combination of the Environmental Land and Water Management Act and local zoning regulations. Only major development is subject to state-level regulation. Water is managed by a different level of government, the regional water management districts established under the 1972 Florida Water Resources Act. Although in practice the two systems have tended to complement one another, there are serious inefficiencies attributable to the lack of statutory consolidation.

Land and water resources constitute a complex, interrelated system. Planning for their wise and beneficial use calls for a unified coordinated effort if the interests of all the people of Florida are to be properly served and protected. Methods of obtaining such coordination have been under study for the past year by a special task force appointed by Governor Bob Graham.[7] Legislative proposals to implement the recommendations of that task force will be put before the 1980 Florida Legislature. (See the article by Nancy Stroud in this issue.) It is to be hoped that the recommendations will be enacted into law to provide the framework for sound, unified land and water management for the 1980s and beyond.

[7] *See Resource Management Task Force,* Final Report to Governor Bob Graham *(January, 1980)*

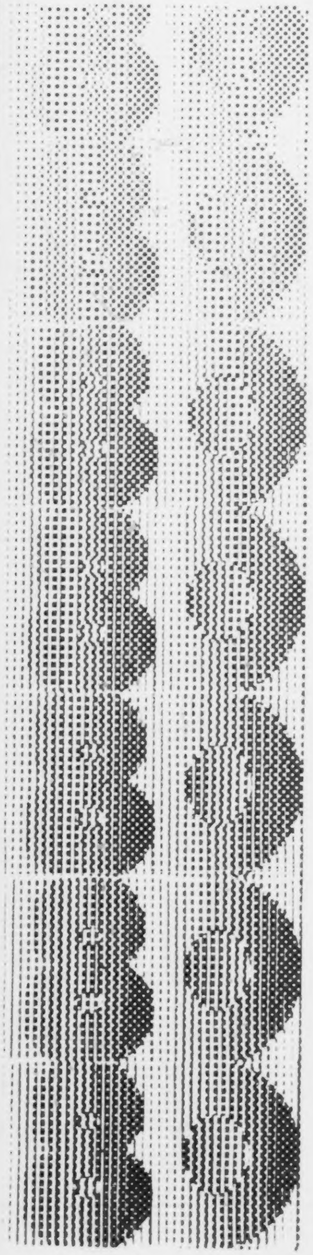


Changes proposed for the 80s

by governor's resources task force

Nancy E. Stroud

Research Associate
FAU-FIU Joint Center
for Environmental
and Urban Problems



Deficiencies in Florida's landmark resource management laws of the past decade were pointed out by business, government and other representatives from around the state to a citizen's task force which has completed a year-long study.

Thirty-six administrative and legislative actions have been recommended to refine and strengthen the laws to meet the needs of the 1980s. Some of the suggested changes may be brought before the 1980 Florida Legislature.

Governor Bob Graham commissioned the eighteen-member Resource Management Task Force in January, 1979, to review the performance of the laws and government in managing Florida's valuable resources. The group's final report was published through the governor's office in January, 1980.

The task force began its work with the realization that Florida in the 1980s promises to continue as a high growth state, with the attendant problems and opportunities that growth entails. On October 15, 1979, *U. S. News and World Report Study* indicated that at the end of the decade, Florida will be the fourth most populous state in the nation. This rank is confirmed by the University of Florida Bureau of Economic and Business Research, which projects Florida's 1990 population to be more than eleven and one-half million people. The projections are based on full-time residents; adding Florida's tourist population to those figures increases the impact that will be felt on the state's resources.

The facet of increased growth will not change from the 1970s, but the setting for that growth will certainly differ. Energy constraints will be felt more keenly. Economic conditions will be affected by those energy constraints, and do not promise to be any more stable than in the last decade. Population needs and economic forces will necessarily put more pressure on the use of state natural resources such as land, water, and air.

The setting of the 1980s is also different because the last decade has provided valuable experience in resource management. There is a clearer view of environmental management and economic development as two sides of the same coin. The experience has increased the awareness and knowledge of the interrelationship between different resources such as land and water, and water quality and water quantity. Experience has also shown that the public and private sectors can together accomplish wise use and protection of critical resources.

Reviewing the success or failure of the resource management laws in the seven or eight years most have been in existence, the task force found that their implementation has been grounded in a sound legislative base. The laws established methods of protecting and using valuable water and land resources and of planning for development, particularly large-scale development, so as to protect critical resources and provide for economic and social impacts on host communities.

However, the deficiencies of the laws quickly became obvious when the task force heard from various business, government, and other representatives from throughout the state. From a business perspective, the laws were criticized as being duplicative, time-consuming and expensive, and unpredictable in implementation. Representatives of different government agencies found a lack of clear policy direction, an inadequate commitment of state financial and technical resources, and intergovernmental conflicts. Others found a willful subterfuge of the laws, gaps in coverage, and a diversity in needs and capabilities throughout the different regions in the state.

Recommendations

Two prominent concerns recur throughout the task force recommendations.

The first is a need for a policy framework to integrate the activities and responsibilities of the various management agencies. The development of concise and specific state and regional policies is recommended to guide, for example, local government comprehensive plans, developments of regional impact, and water management projects.

A second concern is the chronic underfunding of laws. The task force found that, while Florida has gained national accolades in many cases for rationalizing and putting innovative laws on the books, the implementation of the laws is seriously hampered by lack of funding. As task force Chairman Jim Shimberg, a Florida developer, asserts, "The price of legislative commitment to fund resource management is small compared to the cost of neglect."

Specific task force recommendations are made in eight different areas of interest. The first set, considered by the task force to be the "keystone" of the whole report, recommends the development of state and regional policies to guide the activities of different agencies and levels of government to common purposes. Such policies would be formally adopted and eventually be the standards by which local government comprehensive plans are reviewed and certified at regional and local levels. The policies are not meant to be all-inclusive or to intrude on local issues, but would apply only to those issues that are of state and regional concern.

The strengthening and restructuring of regional agencies is another primary recommendation. The task force recognized that regional resource management is a present reality in Florida, but that in large measure it is fragmented, invisible and duplicative. Recommendations urge that regional agencies be given policy guidance, their activities be integrated, and that they be given greater ability to effectively implement plans. Specifically, this involves restructuring regional planning councils to include mandatory county membership and gubernatorial appointments to the council boards.

Numerous suggestions for improving the developments of regional impact (DRI) process are made. A technical reevaluation of standards and guidelines determining when a development has regional impact is highly recommended, with a goal of moving toward more qualitative standards in addition to quantitative standards. More flexibility in administrative revision and adoption of standards is also recommended, retaining a legislative oversight. Several methods for reducing time and maximizing agency cooperation in the DRI review process are suggested, as is an experimental program to determine if local governments which meet strict planning criteria and have implementing capability could conduct DRI review without regional agency involvement.

The task force recommended that the state adopt a state water policy by rule, and that water quality and water quantity management be integrated in the most capable regional agency in each region. The delegation of four federal regulatory programs to the state is recommended, including as a first priority the National Pollutant Discharge Elimination System. Other programs would include air pollution responsibilities, hazardous waste management, and underground injection. State responsibilities for these programs would allow management geared more closely to state needs in lieu of mandated federal regulation.

New initiatives recommended for Florida coastal management include designation of 1980 as the Florida Year of the Coast, instituting civil penalties for better enforcement of coastal protection laws, and more attention to coastal disaster protection. The task force also outlined the needs for study of the protection of valuable agricultural lands from urban encroachment.

1980 legislative issues

The recommendations have both short- and long-range implications. For example, long-range possibilities for consolidation of regional agencies were considered, as were possibilities for a significant refocus of the DRI responsibilities to local governments. The long-range possibilities will be influenced by the success or failure of changes and improvements made in the short run. Some of those short-range issues that might be considered in the 1980 legislative session include the restructuring of the regional planning councils, amendments to the Chapter 380 developments of regional impact process, and the delegation of federal programs to the state. These legislative changes, in addition to administrative changes by the governor, can set the course for more effective, productive and protective resource management in the 1980s.

. . . . implementation of the laws is seriously hampered by lack of funding . . . .

Sources of information

1979 Florida population

Between July 1, 1978, and April 1, 1979, Florida's population increased 3.1 percent, from 8,966,395 to 9,245,231. Since 1950 the state's population has more than tripled, while that of the United States has increased by only 45 percent.

The latest figures on Florida population by state, county and municipality were released in February in **Florida Estimates of Population: April 1, 1979** by the Population Division of the Bureau of Economic and Business Research. The document provides data on population changes in counties, SMSAs and planning districts; births, deaths and net migration; ranks of counties and specified cities by population; and age distributions by state and counties.

The **Estimates** are available from the Bureau of Economic and Business Research, 221 Matherly Hall, University of Florida, Gainesville, Florida, 32611, at $9.00 per copy. Subscribers to the Bureau's **Population Studies** will be mailed forms enabling them to receive the **Estimates** at a reduced price. Payment must accompany orders for less than $20.00. Florida residents should add 4 percent sales tax.

Research aid

Articles from *Dimensions* are included in the listing of more than 2,200 separate works in the current annual **Bibliography** of the Association for University Business and Economic Research (AUBER). The 286-page compilation (Volume XXIII) includes monographs and working papers not found in standard indexes as well as regional business reports, journals, conference reports, books and technical reports produced in 1978 by member institutions of AUBER and of the American Assembly of Collegiate Schools of Business (AACSB). The references are listed in three different ways: by subject, institution and author. The bibliography covers more than 125 subjects, with the largest number of entries in the categories of business and public administration, marketing and advertising, regional economics, industry studies, and financial markets. The bibliography may be ordered from the Bureau of Business Research, 209 Armstrong Hall, West Virginia University, Morgantown, 26506, prepaid at $12.50 with checks payable to AUBER-WVU Bookstore.

BUSINESS & ECONOMIC DIMENSIONS

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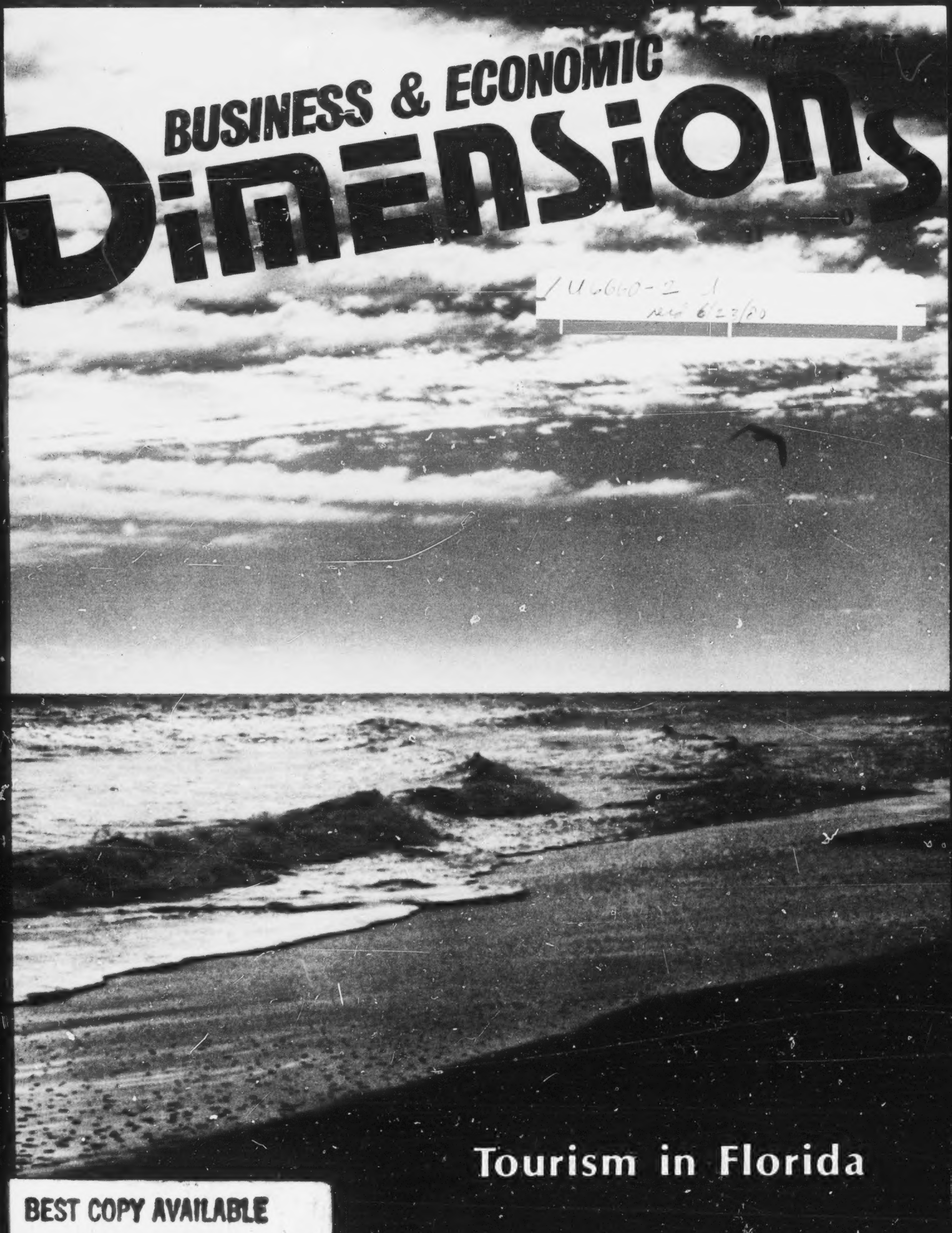

Tourism in Florida

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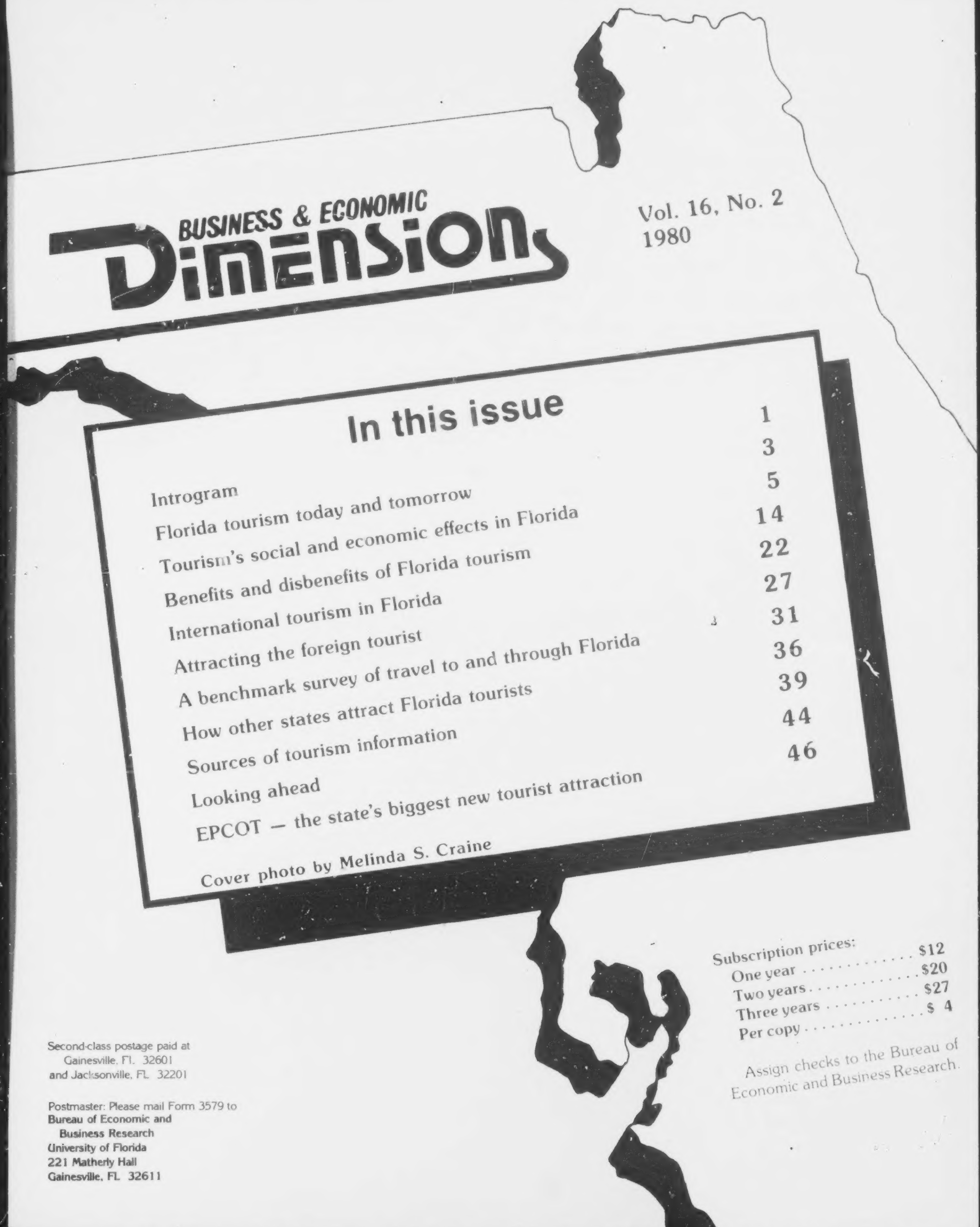

BUSINESS & ECONOMIC DIMENSION

Vol. 16, No. 2
1980

In this issue

Introgram 1
Florida tourism today and tomorrow 3
Tourism's social and economic effects in Florida 5
Benefits and disbenefits of Florida tourism 14
International tourism in Florida 22
Attracting the foreign tourist 27
A benchmark survey of travel to and through Florida 31
How other states attract Florida tourists 36
Sources of tourism information 39
Looking ahead 44
EPCOT — the state's biggest new tourist attraction 46

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introgram

So thoroughly has tourism been publicized as Florida's major industry that some visitors profess surprise when they discover that there are people in the state who are not barmaids, bellboys and bus drivers.

But tourism is not AN industry. There is no one Standard Industrial Classification Code by that name. A variety of types of firms sell services and goods to the vacationers who come to the Sunshine State: airlines, filling stations, motels, restaurants, rental car agencies, to name a few.

I once observed a vegetarian trying to take the bits of beef out of his spaghetti and meat sauce so he could feel confident about eating the remainder. To measure the impact of tourism is not unlike this task. A number of people have been assembled to do this task of pulling out the measures of tourism from the nontourist aspects of the economy and take a good look at this important phenomenon.

Edward N. Gilbert begins with an overview of the activities involved in attracting and providing for tourists. He is well qualified to do so from his post as director of the Florida Division of Tourism in Tallahassee. He prophesies that the agency's new campaign will be a success despite the fact that many English teachers in the state will no doubt throw up their hands in horror and take off for Cambridge, Mass., or Cambridge, England, when they hear the slogan being used.

A geographer and an economist at Florida Atlantic University have teamed up to try and answer the question: Do the benefits derived by Floridians from tourism really outweigh the costs? Ronald R. Schultz and William B. Stronge were able to make this very thorough study, excerpted here in two articles, for the Florida Department of Community Affairs because of a STAR grant.

(continued on page 2)

The next article represents the collaboration of an academician, Barbara K. Lutz of the University of South Florida, and Elizabeth Finn, a statistician with the Florida Division of Tourism. They investigated the tremendous growth in the number of visitors from abroad who are now coming to enjoy Florida's climate and attractions, spurred by the decline in the value of the dollar.

Ann C. Pierce, managing editor of *Dimensions*, examines programs being employed to attract the foreign visitor.

The editor presents highlights from a benchmark study, the 1977 National Travel Survey conducted by the U.S. Bureau of the Census. Considerable information is presented regarding the characteristics of travelers to Florida from other parts of the United States.

Greg Kerber, also a member of the *Dimensions* staff, writes about the results of a survey he made of tourist promotion agencies in nearby states.

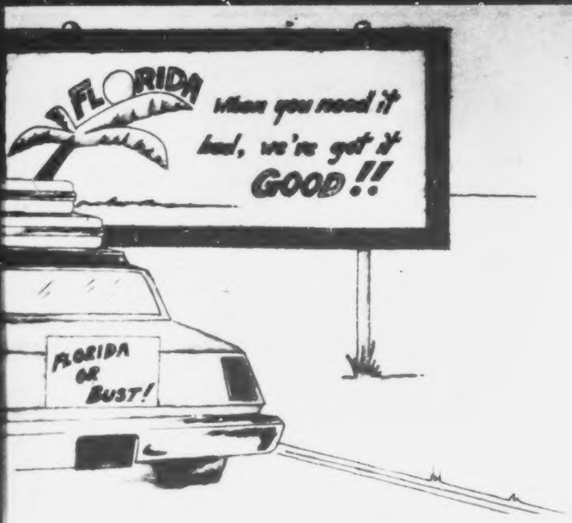
Frances W. Terhune of the Bureau discusses and lists sources of tourism information available from government agencies, research organizations, universities, libraries, and others.

An important private-sector view of the state's tourism climate is provided by Walt Disney World Vice President Robert C. Allen.

Finally, our issue closes with a description of Disney's Experimental Prototype Community of Tomorrow (EPCOT), said to be the largest private construction project in the U.S. in the next three years and certain to be the largest new tourist attraction in Florida for the forseeable future.

We are confident that this fact-packed issue will make a real contribution to everyone's understanding of this important cultural, economic and social activity — tourism in Florida.

—Ralph B. Thompson


FLORIDA
When you need it bad, we've got it GOOD!!
FLORIDA OR BUST!

Today & Tomorrow ....

Florida Tourism's Better Than Ever

Edward N. Gilbert

**Director
Florida Division of Tourism**

The state of the tourism industry in Florida has rarely been better than it is now. Last year, despite all the problems the industry had to weather, was the best year ever. All the traditional indicators point to even greater success in the coming years.

After all, more than thirty-five million visitors came to Florida in 1979, and they spent nearly $16 billion. Those figures not only represented significant increases over 1978 in a year that could have been catastrophic, but they also strengthened Florida's claim of being the leading tourist destination in the United States. The expenditure figures also have given us the basis for our newest boast of being one of the top tourist destinations in the world in terms of dollars spent by visitors.

But our optimism is not based solely on historical statistics and numbers. We can also point to decisions made by major tourist attractions in Florida to expand, and the rapidly increasing airline service to Florida as other reasons why the future looks bright.

Florida's tourism leaders are among the most sophisticated and business-wise of any in the entire industry, and their confidence in the future is firmly based on a strong foundation of research and good business sense.

Therefore, when we look at multimillion dollar expansions opened during the past year at Sea World and Cypress Gardens, and the spectacular expansion under construction at Walt Disney World, we can be certain that our future is indeed bright.

If that were not sufficient evidence on which to base a prediction for a strong future, there is the evidence provided by domestic airlines.

Not only have several airlines instituted new service to Florida during the last year, but airlines with existing service to the state have increased the number of routes and flights to keep pace. Again, these business decisions, made by people in one of our most sophisticated industries, are based on sound data pointing to a strong future for Florida tourism.

But not all the optimism and good news about our industry is coming from the private sector. Within the Division of Tourism in Tallahassee there are also great hopes for the coming years and we have taken and continue to take actions which support that belief.

For the first time last year, the Division of Tourism conducted a competitive selection process for an advertising agency, and the result has been the creation of an advertising campaign which should be the best tourism campaign of the 1980s, surpassing even the phenomenal success of the "I Love New York" campaign of the past decade. "When you need it bad, we've got it good" will be THE campaign of this decade and will thrust Florida's image to even greater heights.

The greatest potential

Within our division we continue to take major steps in the attempt to reach our full potential as a tourist destination, and the greatest untapped potential at the present time lies in the international marketplace.

Along those lines, we have opened a Latin American sales office in Coral Gables and are about to open another office in Toronto to serve our lucrative Canadian market. Later this year we will open an office in London to serve the European market.

This commitment to international tourism development is not coming at the expense of our domestic campaigns. On the contrary, we have never spent more money in domestic advertising than we did in 1979, but we simply cannot ignore the vast potential of the international market.

A quick look at some of the figures shows why. As recently as 1973, barely more than 500,000 overseas visitors came to Florida. But with the devaluation of the dollar, strong economies in Latin American and European countries and the skyrocketing increase in the number of overseas flights to Florida, our international visitation has been spiraling. Last year, for instance, we estimate that 1.5 million overseas visitors came to Florida and spent about $1.4 billion. That is nearly a 200 percent increase in foreign visitation in little more than half a decade.

The positive signs for the eighties are numerous — too numerous to mention here — but those listed are just a portion of the reasons why our industry is optimistic.

As noted earlier, the industry is made up of some of the best business minds in the nation, and part of being a good businessman is having the ability to temper optimism with reality and not to bury one's head in the sand hoping problems will disappear.

Some obvious problems

And make no mistake, we do have problems. Problems that could, if allowed to reach extremes, jeopardize most if not all of the successes mentioned up to this point. Add to that the fact that we have no way of predicting when, or even if, the problems will crop up or in what severity, and you not only have a problem, but an exasperating one at that.

The potential problems are obvious: gasoline shortages, whether perceived or real; escalating gasoline prices; recession; possibly even depression. Add to that the possibility that a stronger dollar might make international travel to Florida less attractive from an economic standpoint, and the problems are potentially severe.

Nevertheless, we in the tourism industry have the confidence that, barring any catastrophic economic, political or social happening, we will be able to cope with and prosper through any problems that might present themselves.

. . . we are confident enough to predict that Florida could come through a major crisis as well or better than practically any other major tourism destination in the world. . .

Last year is a good example. In the spring we were hit by a strike of independent gasoline truckers. Shortly after that, the long gasoline lines which had been plaguing the rest of the nation appeared in Florida.

At one point, automobile traffic to Florida was off more than 21 percent from 1978 totals. But, with the excellent cooperation of the Florida Hotel and Motel Association, the Campground Association, the Restaurant Association and the Florida Attractions Association, we instituted a wide-ranging energy contingency program which averted what could have been a dismal situation.

Heading off disaster

The program included increased publicity, advertising and marketing efforts, and a telephone hotline manned twenty-four hours a day. Several other measures coordinated with the governor's office and the Department of Transportation rounded out the program.

By August, our travel figures were running ahead of 1978, and what could have been a disastrous year turned out to be a successful one.

In fact, our total number of visitors increased by almost 5 percent over 1978. True, automobile travel was down by about 5 percent, but that loss was more than offset by a whopping 24 percent increase in air travel.

With 1979 under our belt, we now feel more confident in predicting that our industry in Florida could survive similar problems in the future, but no one is foolish enough to predict that regardless of what happens our industry will prosper. We all know that in these times, domestic and world political and social conditions could change more rapidly than anyone could imagine.

But, we are confident enough to predict that Florida could come through a major crisis as well or better than practically any other major tourism destination in the world. That prediction is based on the fact that our industry is sophisticated and more unified than it has ever been, and that Florida has probably the broadest consumer appeal of any major destination.

We look forward to the 1980s.

Social and Economic Effects of Tourism in Florida

ORIDA OUTLOOK
REC
FLORIDA

FLORIDA
When you need it bad, we're got it GOOD!!
FLORIDA OR BUST!

Ronald R. Schultz

Associate Professor
of Geography
Florida Atlantic University

and

William B. Stronge

Associate Professor
of Economics
Florida Atlantic University

It is generally agreed that tourism is one of the most significant industries in Florida. Official estimates from the Florida Division of Tourism indicate that over 32 million out-of-state U.S. and Canadian tourists spent over $15.5 billion in Florida during 1979. These figures exclude tourists who did not travel to the state by auto or by air and also exclude foreign visitors other than Canadians. This article contains an overview of Florida tourism, together with some analysis of the likely impact of the increased cost of fuel for the future of the industry.

Defining the tourist industry

Most industries are distinguished by the goods and services that they produce. The tourist industry, however, does not fit into a product classification scheme. Instead, it is composed of those parts of all other industries which sell to tourists. The distinguishing feature of tourism is the nature of its customers, rather than its products. Because of this, the basis of the definition of the industry is the definition of a tourist. The dictionary defines a tourist as "a person traveling for pleasure." Most empirical implementa-

This article and the one which follows have been condensed and updated from a report on "The Social and Economic Effects of the Florida Tourist Industry" completed by the authors in November, 1978, with a STAR grant for the Office of Manpower Planning, Florida Department of Community Affairs.

Though all statistics and conclusions have been updated since the original publication, the authors caution that figures for the third and fourth quarters of 1979 are preliminary and may be subject to change.

. . . over the past five years the number of annual out-of-state and Canadian visitors to Florida . . . has increased 23 percent . . . . At the same time, tourist expenditures increased by 80 percent . . .

tions of this definition focus on two requirements. The first is that a tourist is somebody away from home for an extended period of time, "away from home" usually being defined in terms of a mileage requirement such as 50 or 100 miles. In the Florida statistics it is defined by the requirement of out-of-state residency, but Georgia and Alabama residents traveling less than 100 miles are excluded from the statistics. Second, the individual must be away for an extended period of time, which usually means in excess of twenty-four hours. A third requirement is less clearcut. A tourist is regarded as someone not taking part in local economic activities in a manner similar to local residents. This requirement excludes students from out of state.

It is noteworthy that tourists are not restricted to those visiting the state for pleasure. In particular, those visiting the state on business or attending conventions are included in the Florida statistics. This is in line with accepted practice by other tourist agencies outside Florida, and it is a sensible decision from the point of view of analyzing the importance of the industry. The distinction between traveling for pleasure and for business is not very clear. Many individuals attending a convention would regard the trip as a business trip, but their economic impact might differ little from the impact of vacationers.

Although the precise definition of the tourist industry includes those parts of every Florida industry that sells directly to tourists, certain industries are more dependent on tourist sales than are others. Data collected on the distribution of tourist expenditures since 1976 show that the most important item purchased by tourists in Florida is food, followed by lodging, transportation and entertainment. One out of every three tourist dollars goes for food and one out of every four goes for lodging. Transportation and entertainment each account for 14 percent of the total, as does a miscellaneous category that includes gifts. Thus, the primary economic impact of tourism is felt in the hotel, restaurant, transportation and entertainment industries. We might call these the front-line tourist industries.

The impact of the tourist industry ripples its way through the economy in two ways. The front-line tourist industries purchase from a wide variety of suppliers. Hotels purchase goods such as beds, linens and energy and services such as advertising, accounting and the like. Restaurants purchase food, tables, chairs and so on. As tourist expenditures in the front-line industries expand, these industries expand purchases from their suppliers, the latter in turn expand their own purchases, and so on.

The front-line industries hire additional factors of production, particularly labor, as tourist expenditures expand. So do their suppliers. The direct (front-line) and indirect (supplying) increases in employment result in an increase in payrolls, which in turn generates increased expenditures on consumer goods and services and further increases in income in the consumer goods industry and its suppliers. This second impact of tourist expenditures through payrolls is called the multiplier effect.

In this article we measure the significance of the tourist industry only in terms of its primary economic impact, examining trends in the numbers and expenditures of tourists, and the changing shares of the front-line industries in these expenditures.

Tourists and expenditures in Florida, 1975-79

Over the past five years the number of annual out-of-state and Canadian visitors to Florida by auto and air has increased from 26.7 to 32.9 million, an increase of 23 percent (Table 1). At the same time, tourist expenditures increased by 80 percent, rising from $8.7 billion in 1975 to $15.6 billion in 1979. The greater rise in expenditures than in the number of tourists reflected an increase in expenditures per tourist from $325 to $474. Even discounting an increase in length of stay from 13 to 14 nights over the period, expenditures per visitor per day still increased by over one-third, from $26 to $34.

Table 1.—Aggregate tourism and expenditures in Florida, 1975-1979

	1975	1976	1977	1978	1979	Growth 1975-79 (percent)
Visitors (millions)	26.71	28.93	29.18	32.37	32.85	23.0
Expenditures ($ millions)	8,678.20	10,190.00	11,274.40	12,934.70	15,575.90	79.5
Expenditures/visitor ($)	324.93	352.27	386.44	399.60	474.15	45.9
Average number of nights stayed	12.72	13.74	14.14	13.96	13.85	8.9
Expenditure/visitor/day ($)	25.54	25.64	27.33	28.62	34.23	34.0

Note: Some figures may not compute exactly due to rounding.
Source: Computed from Florida Department of Commerce, Division of Tourism, Florida Tourist Study, Executive Summaries.

Table 2.—Distribution of tourist expenditures in Florida, 1976-1979

	1976		1977		1978		1979		Average
	$ M	%	$ M	%	$ M	%	$ M	%	%
Food (including groceries)	3,087.7	30.3	3,665.5	32.5	4,260.1	32.9	4,958.0	31.9	31.9
Lodging	2,479.3	24.3	3,000.9	26.6	3,350.3	25.9	4,088.2	26.3	25.8
Transportation (including gasoline)	1,526.0	15.0	1,610.5	14.3	1,799.9	13.9	2,151.9	13.8	14.2
Entertainment	1,517.6	14.9	1,476.0	13.1	1,850.0	14.3	2,186.9	14.0	14.1
Gifts and misc.	1,579.4	15.5	1,523.3	13.5	1,675.1	12.9	2,180.7	14.0	14.0

The distribution of tourist expenditures by type for the 1976-79 period is given in Table 2. Since the proportionate distributions of these expenditures have remained relatively stable over the period, we can construct a price index for tourist goods and services by weighting appropriate components of the Consumer Price Index. Table 3 contains price indexes for food, transportation, entertainment and commodities less food. The food-at-home index was weighted at 20 percent, and the food-away-from-home at 80 percent. The private transportation component of transportation had a weight of 68 percent, reflecting the average share of auto arrivals in the number of tourists in the period. The commodities-less-food price index was used to deflate the gifts and miscellaneous expenditures category. All price indexes are national and are annual averages.

Tourists harder hit by price inflation

Tourist price inflation has been more rapid than consumer price inflation over the 1976-79 period, mainly due to a sharp rise in hotel and motel rates (the lodging component). Air fares have increased only moderately, as have entertainment and miscellaneous prices. Food price and auto transportation price increases have been relatively rapid.

Table 4 contains tourist expenditures adjusted for inflation. Even after adjustment for rising prices, tourist expenditures have increased rapidly over the period 1976-79. Growth has been particularly rapid in food and entertainment expenditures and least in gifts and transportation expenditures.

The inflation-adjusted expenditures per tourist presented in Table 5 show that total expenditures per tourist have been growing at an average annual rate of 1 percent more than the inflation rate. Since average stay has increased slightly over the period, average expenditures per tourist day, adjusted for inflation, have only increased 0.8 percent per year. Most of the increase has been for food and entertainment, with declines in transportation and gifts.

. . . air tourists are spending less per day on all items except transportation and gifts; the reverse is true for auto visitors . . . .

Table 3.—Annual average price indexes for Florida tourists, 1976-1979 (1967 = 100)

	1976	1977	1978	1979	Average annual inflation
Food at home	179.5	190.2	210.2	234.0	10.1
Food away from home	186.1	200.3	218.4	243.0	10.2
Food	184.8	198.2	216.7	241.2	10.2
Lodging	175.7	186.0	213.1	249.8	14.1
Private transportation	164.6	176.6	185.0	212.4	9.7
Air fares	172.2	182.0	190.6	201.6	5.7
Transportation	167.0	178.3	186.8	208.8	8.3
Entertainment	159.8	167.7	176.2	189.8	6.3
Commodities less food	156.6	165.1	174.7	197.4	8.7
TOTAL	172.6	183.5	200.1	225.7	10.3
Overall CPI	170.5	181.5	195.4	217.4	9.2

Note: The average shares of the items in total expenditures over the four-year period are used as weights to compute the price indexes. Food at home has 80 percent of the food weight. Private transportation has a weight equal to the average share of auto tourists in the total.

Table 4.—Inflation-adjusted tourist expenditures by type, 1976-1979

(in millions of dollars)

	1976	1977	1978	1979	Average annual growth (%)*
Food	1,670.8	1,859.5	1,965.9	2,055.6	7.7
Lodging	1,411.1	1,613.4	1,572.2	1,636.6	5.3
Transportation	927.1	903.3	963.5	1,030.6	3.7
Entertainment	949.7	880.1	1,049.9	1,152.2	7.1
Gifts and misc.	1,008.6	922.6	958.8	1,109.7	3.2
TOTAL	5,903.8	6,144.1	6,464.1	6,901.1	5.6

*Average annual growth in tables in this article is calculated as the percentage change of the latest year over the earliest year divided by the number of years spanned.

Note: The items do not add to the total because the latter has been obtained directly. The unadjusted total was divided by its own consumer price index. If the sum of the adjusted items was divided into the unadjusted total the result would be an implicit price index. Since the totals obtained by both methods are very similar, we decided to use the direct method because the explicit price index is more readily understood. Additionally, an implicit price index would be more sensitive to errors in estimating the expenditure proportions.

Table 5.—Inflation-adjusted expenditures per tourist, 1976-1979

(in dollars)

	1976	1977	1978	1979	Average annual growth (%)
Food	57.75	63.38	60.73	62.58	2.8
Lodging	48.75	55.29	48.57	49.82	0.7
Transportation	32.05	30.96	29.77	31.37	-0.7
Entertainment	32.83	30.16	32.43	35.07	2.3
Gifts and misc.	34.86	31.62	29.62	33.63	-1.2
TOTAL	204.07	210.56	199.69	210.79	1.1

Note: The items do not add to the total because the latter has been obtained directly.

Examination of available income statistics on tourists shows that in absolute terms the typical family visiting Florida in 1979 had an annual income of $25,637, and that its income has grown an average of 8.9 percent per year since 1976 (Table 6). However, when these income figures are also adjusted for inflation, the data indicate a very slight decline in the real income of a Florida tourist since 1976.

With inflation-adjusted expenditures per tourist increasing at an average rate of 1 percent per year (Table 5) and the slight decline in the real income of tourists, the proportion of their income that Florida tourists spend on visits to the state must be increasing. This is confirmed by Table 7. Overall, the proportion of real income spent by Florida tourists because of their visit to the state has increased from 1.72 percent to 1.79 percent, an average annual increase of 4.1 percent. This increase is most pronounced in food and entertainment, whereas transportation and gifts proportions have remained relatively stable.

Tourism by mode of travel

Tourist data prepared by the Division of Tourism are disaggregated by mode of travel—arrival by air and arrival by automobile.[1] Of the 32.9 million visitors in Florida in 1979, 20.9 million or 64 percent arrived by automobile (Table 8). Although arrivals by both modes have increased over the last five years, the growth rate in the number of air arrivals (15.8 percent per annum) overwhelms the moderate growth in auto arrivals.

Expenditures by auto arrivals are about $10 billion, almost double the expenditures of those who arrived by air, although both have grown close to 20 percent a year. Since growth in the number of auto tourists has been moderate, the growth in their expenditures is mainly due to a sharp rise in per capita spending. Expenditures per air tourist have increased very slowly. In 1979, expenditures per auto tourist ($478.28) exceeded expenditures per air tourist ($466.59) for the first time.

Auto tourists stay over sixteen nights in the state on an average, and this length of stay has been increasing. Air tourists stay

Table 6.—Absolute and inflation-adjusted median household income for tourists

(in dollars)

	1976	1977	1978	1979	Average annual change (%)
Absolute	20,251	20,767	22,811	25,637	8.9
Inflation-adjusted	11,877	11,442	11,674	11,793	-0.2

Note: Absolute income was deflated by dividing by the overall CPI in Table 3.

Table 7.—Ratio of inflation-adjusted tourist expenditures per tourist to inflation-adjusted median household income*

	1976	1977	1978	1979	Average annual growth (%)
Food	0.49	0.55	0.52	0.53	2.7
Lodging	0.41	0.48	0.42	0.42	0.8
Transportation	0.27	0.27	0.26	0.27	0.0
Entertainment	0.28	0.26	0.28	0.30	2.4
Gifts and misc.	0.29	0.28	0.25	0.29	0.0
TOTAL	1.72	1.84	1.71	1.79	1.4

*Table 5 divided by Table 6, row 2.

Table 8.—Tourism in Florida by mode of travel, 1975-1979

	Mode	1975	1976	1977	1978	1979	Average annual growth (%)
Visitors (millions)	Auto	19.34	20.90	20.66	22.06	20.85	2.0
	Air	7.36	8.03	8.51	10.31	12.01	15.8
Expenditures ($ millions)	Auto	5,466.6	6,674.4	7,525.3	8,416.8	9,972.1	20.6
	Air	3,231.6	3,515.6	3.749.1	4,517.9	5,603.8	18.4
Expenditures per visitor ($)	Auto	281.54	319.35	363.54	380.96	478.28	17.5
	Air	438.96	437.97	440.40	438.32	466.59	1.6
Average number nights stayed	Auto	13.26	14.73	15.77	16.00	16.30	5.7
	Air	11.31	11.15	10.17	9.60	9.50	-4.0
Expenditures per visitor day ($)	Auto	21.23	21.68	23.05	24.14	29.34	9.6
	Air	38.81	39.28	43.30	45.61	49.11	6.6

Note: Some figures may not compute exactly due to rounding.

about ten days and their length of stay has been declining. The shorter stay of air tourists compensates somewhat for their lower per capita expenditures in that their expenditures per visitor day are higher, but expenditures per day have risen more rapidly for auto tourists.

The distribution of expenditures by type for each mode of travel is given in Table 9. These data are subject to sizable reporting errors but again show remarkable stability over the period. Auto travelers have increased the share of their expenditures going to food and lodging, and decreased the share going for transportation and gifts. Air travelers have reduced the proportion for entertainment but increased the proportion for gifts.

The expenditure shares of Table 9 can be used to weight the consumer price indexes of Table 3 in order to construct tourist price indexes by mode as in Table 10. Auto tourists were assigned weights of 3:1 for food-away to

Table 9.—Distribution of tourist expenditures in Florida by mode of travel, 1976-1979

	1976		1977		1978		1979		Average
	$ M	%	$ M	%	$ M	%	$ M	%	percent
Auto arrivals									
Food	1,967.2	29.5	2,419.8	32.2	2,765.8	32.9	3,131.2	31.4	31.5
Lodging	1,506.7	22.6	1,957.9	26.0	2,117.6	25.2	2,463.1	24.7	24.6
Transportation	1,012.7	15.1	1,077.3	14.3	1,121.1	13.3	1,356.2	13.6	14.1
Entertainment	1,012.8	15.2	995.7	13.2	1,298.1	15.4	1,525.7	15.3	14.8
Gifts and misc.	1,174.5	17.6	1,076.3	14.3	1,112.4	13.2	1,485.8	14.9	15.0
TOTAL	6,673.9	100.0	7,527.0	100.0	8,415.0	100.0	9,962.0	100.0	----
Air arrivals									
Food	1,120.5	31.9	1,245.6	33.2	1,494.3	33.1	1,826.8	32.6	32.7
Lodging	972.6	27.7	1,043.0	27.8	1,232.7	27.3	1,625.1	28.0	28.0
Transportation	513.3	14.6	533.3	14.3	678.8	15.0	795.7	14.2	14.5
Entertainment	504.8	14.3	480.3	12.8	551.9	12.2	661.2	11.8	12.8
Gifts and misc.	404.9	11.5	447.0	11.9	562.7	12.4	649.9	12.4	12.1
TOTAL	3,516.1	100.0	3,749.2	100.0	4,520.4	100.0	5,603.8	100.0	----

Note: Some figures may not compute exactly due to rounding.

food-at-home, and air travelers were assigned weights of 9:1. Air travelers were assumed to travel exclusively by air. Inflation has been more rapid for auto than air tourists primarily because transportation costs have risen more rapidly than airfares.

Inflation-adjusted tourist expenditures by mode given in Table 11 show that air tourist expenditures have risen at almost double the rate of those of auto tourists. Growth has been particularly strong for air tourist expenditures on transportation and gifts, and particularly weak for entertainment expenditures.

Table 10.—Price indexes for tourist expenditures by mode, 1976-1979

	1976	1977	1978	1979	Average annual growth (%)
Food:					
Auto	184.5	197.8	216.4	240.8	10.2
Air	185.4	199.3	217.6	242.1	10.2
Lodging:					
Auto	175.7	186.0	213.1	249.8	14.1
Air	175.7	186.0	213.1	249.8	14.1
Transportation:					
Auto	164.6	176.6	185.0	212.4	9.7
Air	172.2	182.0	190.6	201.6	5.7
Entertainment:					
Auto	159.8	167.7	176.2	189.8	6.3
Air	159.8	167.7	176.2	189.8	6.3
Gifts and misc.:					
Auto	156.6	165.1	174.7	197.4	8.7
Air	156.6	165.1	174.7	197.4	8.7
TOTAL:					
Auto	171.6	182.6	202.8	229.2	11.2
Air	174.2	187.3	205.2	229.4	10.6

Deflated per capita expenditures by mode in Table 12 confirm the results of Table 8 that did not adjust for inflation. Auto tourist expenditures per capita exceeded air tourist expenditures for the first time in 1979, reflecting an upward trend over all expenditure categories for auto tourists and a declining trend in all categories for air tourists. Hence the growth in total air tourist expenditures reflects a growth in numbers rather than per capita expenditure.

Since air tourists stay a shorter time than auto tourists, it is interesting to examine the trends in inflation-adjusted expenditures per tourist day, as given in Table 13. The results show that most of the per capita differences between the two modes can be explained by differences in the length of stay. However, a slight decline in air tourist expenditures and a slight growth in the auto figures is still evident. Air tourists are spending less per day on all items except transportation and gifts; the reverse is true for auto tourists.

Seasonality

The Division of Tourism interviews a sample of departing tourists each quarter—a procedure which yields important data on a quarterly basis, but also introduces some errors in the seasonal pattern. Visitors departing during the first few days of the second quarter would appear in second-quarter statistics, although the majority of their activities were conducted in the first quarter. This problem occurs in all quarters and would be offsetting if tourist behavior was identical year-round. That it is not is discussed below.

Florida's tourist season as measured by total tourist expenditures (Table 14) begins near the end of the fourth quarter and ends in the middle of the second quarter. Likewise, more tourists leave Florida in the first quarter than in any other. However, a decline of approximately 10 percent occurs in the second quarter, followed by a modest rise in the summer in all years except the latest; a still further decline occurs in the fourth quarter.

In order to interpret the expenditure data, it is helpful to examine the average-length-of-stay data in Table 14. This shows that visitors leaving in the second quarter have stayed an average of about three weeks, and those departing in the first quarter have averaged a little over two weeks. On the other hand, those departing in the last six months of the year have been in Florida a little more than one week. Thus, the second quarter total expenditure figures will be significantly overstated and the fourth quarter figures will be modestly understated. The peak in tourist expenditures, on this basis, occurs in the first quarter but the decline in the second quarter is understated. A sharp drop in the third quarter is followed by a modest recovery in the final quarter.

The seasonal pattern in average expenditures by each tourist each day tends to peak in the fourth quarter, is high in the first quarter, about average in the third quarter (except for 1979) and is relatively low in the second quarter. The latter reflects the long stay of tourists in the second quarter who may have second homes or who have come for the climate and spend less on entertainment.

Quarterly data can also be examined by mode of travel (Table 15). From 1975 through 1977 the peak in the number of tourists departing by automobile occurred in the summer (third quarter), with a moderately smaller peak in the first quarter. In 1978 and 1979 this pattern was reversed, with over a quarter million more auto tourists departing in the first quarter than during the third. Since 1976, the fall (fourth) quarter has had the

Table 11.—Inflation-adjusted tourist expenditures by mode, 1976-1979

(in millions of dollars)

	1976	1977	1978	1979	Average annual growth (%)
Food:					
Auto	1,066.2	1,223.4	1,278.1	1,300.3	7.3
Air	604.4	625.0	686.7	754.6	8.3
Lodging:					
Auto	857.5	1,052.6	993.7	986.0	5.0
Air	553.6	560.8	578.5	650.6	5.8
Transportation:					
Auto	615.2	610.0	606.0	638.5	1.3
Air	298.1	293.0	356.1	394.7	10.8
Entertainment:					
Auto	633.8	593.7	736.7	803.8	8.9
Air	315.9	286.4	313.2	348.4	3.4
Gifts and misc.:					
Auto	750.0	651.9	636.7	752.7	0.1
Air	258.6	270.7	322.1	352.0	12.0
TOTAL:					
Auto	3,889.2	4,122.1	4,149.4	4,350.8	4.0
Air	2,018.4	2,001.7	2,202.9	2,442.8	7.0

Note: The items do not add to the total because the latter has been obtained directly. The unadjusted total was divided by its own consumer price index. If the sum of the adjusted items was divided into the unadjusted total the result would be an implicit price index. Since the totals obtained by both methods are very similar, we decided to use the direct method because the explicit price index is more readily understood. Additionally, an implicit price index would be more sensitive to errors in estimating the expenditure proportions.

Table 12.—Inflation-adjusted expenditures per tourist by mode, 1976-1979

(in dollars)

	1976	1977	1978	1979	Average annual growth (%)
Food:					
Auto	51.01	59.22	57.94	62.36	7.4
Air	75.27	73.44	66.61	62.83	-5.5
Lodging:					
Auto	41.03	50.95	45.05	47.29	5.1
Air	68.94	65.90	56.11	54.17	-7.1
Transportation:					
Auto	29.44	29.53	27.47	30.62	1.3
Air	37.12	34.43	34.54	32.86	-3.8
Entertainment:					
Auto	30.33	28.74	33.40	38.55	9.0
Air	39.34	33.65	30.38	29.00	-8.8
Gifts and misc.:					
Auto	35.89	31.55	28.86	36.10	0.2
Air	32.20	31.81	31.24	29.30	-3.0
TOTAL:					
Auto	186.09	199.52	188.10	208.67	4.0
Air	251.36	235.21	213.67	203.40	-6.4

Table 13.—Inflation-adjusted expenditures per tourist day by mode, 1976-1979

(in dollars)

	1976	1977	1978	1979	Average annual growth (%)
Food:					
Auto	3.46	3.76	3.62	3.83	3.6
Air	6.75	7.22	6.94	6.61	-0.7
Lodging:					
Auto	2.79	3.23	2.82	2.90	1.3
Air	6.18	6.48	5.84	5.70	-2.6
Transportation:					
Auto	2.00	1.87	1.72	1.88	-2.0
Air	3.33	3.39	3.60	3.46	1.3
Entertainment:					
Auto	2.06	1.82	2.09	2.37	5.0
Air	3.53	3.31	3.16	3.05	-4.5
Gifts and misc.:					
Auto	2.44	2.00	1.80	2.21	-3.1
Air	2.89	3.13	3.25	3.08	2.2
TOTAL:					
Auto	12.63	12.65	11.76	12.80	0.5
Air	22.54	23.13	22.26	21.41	-1.7

Table 14.—Florida tourism by quarters, 1975-1979

	Quarter	Number of visitors (millions)	Tourist expenditures ($ millions)	Expenditures per visitor (dollars)	Average nights stayed (number)	Expenditures per visitor per day (dollars)
1975	I	7.793	3,485.7	447.29	16.15	27.70
	II	6.072	2,359.8	388.64	16.34	23.78
	III	6.907	1,390.0	201.26	8.21	24.51
	IV	6.488	1,608.1	247.86	9.00	27.54
1976	I	8.420	4,053.0	481.35	17.42	27.63
	II	6.775	3,047.0	449.74	20.09	22.39
	III	7.085	1,330.0	187.73	7.17	26.18
	IV	6.647	1,759.9	264.77	9.58	27.64
1977	I	8.294	3,476.6	419.17	14.25	29.42
	II	7.006	4,262.7	608.44	24.62	24.71
	III	7.090	1,763.4	248.72	8.86	28.07
	IV	6.785	1,771.7	261.12	8.69	30.05
1978	I	9.378	4,210.8	449.01	15.31	29.33
	II	7.728	4,666.7	603.87	22.85	26.43
	III	7.792	1,861.4	238.89	8.32	28.71
	IV	7.471	2,195.7	293.90	8.95	32.84
1979	I	9.596	4,456.4	464.40	13.91	33.39
	II	7.894	5,328.3	674.98	23.39	28.86
	III	7.737	2,348.6	303.55	7.63	39.78
	IV	7.623	3,442.5	451.59	10.23	44.14

Source: Computed from Florida Tourist Study, Executive Summaries and Quarterly Tourist Surveys.

fewest auto departures. However, expenditures of auto tourists have peaked in the second quarter since 1977. This probably reflects their longer stay and thus the expenditures may have occurred during the first quarter.

The peak in tourists departing by air is in the first quarter and averages approximately 50 percent greater than the next highest quarter (either second or fourth quarter). Air tourist expenditures also consistently peak during the first quarter.

The average number of nights stayed by auto tourists departing during the second quarter has increased from 17.6 in 1975 to 30.6 in 1979. For all other quarters there has been little change in nights stayed by auto tourists. Air tourists who depart during the first six months of the year have visited Florida about three days longer than those departing during the last half of the year. This difference has been diminishing over time.

Expenditures per visitor per day peak in the fourth quarter regardless of mode of travel, but they are also high in the first quarter. Given the rapid inflation of the 1970s, the fourth quarter peak in expenditures will reflect higher prices relative to the first quarter of the same year. Nevertheless, the substantial increase in expenditures per auto visitor per day in the third and fourth quarters of 1979 may reflect some sampling or tabulation error as the increase is of such a magnitude as to be incredible.

Summary and implications

The number of tourists in Florida has grown steadily during the past half decade. The length of stay per visit and inflation-adjusted expenditures per visitor per day have also increased slightly. There has been a decline in the relative importance of auto visitors from 72.4 percent in 1975 to 63.5 percent in 1979 with a corresponding increase in tourists who arrive by air.

All this might suggest that a shift from lesser to more affluent customers is occurring. However, the inflation-adjusted median income of tourists in 1979 is slightly below the figure for 1976. What has happened is that Florida tourists are spending slightly more of their real income on visits to Florida now than they did in 1976. Whether this is a trend or only a deviation around a rather constant pro-

Table 15.—Florida tourism by quarters, by mode of travel, 1975-1979

		Number of visitors		Tourist expenditures		Expenditure per visitor		Average nights stayed		Expenditures per visitor per day	
	Quarter	Auto (millions)	Air (millions)	Auto ($ millions)	Air ($ millions)	Auto ($)	Air ($)	Auto (#)	Air (#)	Auto ($)	Air ($)
1975	I	4.993	2.600	2,031.1	1,373.3	406.78	528.19	18.6	12.7	21.87	41.59
	II	4.325	1.637	1,504.9	816.6	347.95	498.86	17.6	14.1	19.77	35.38
	III	5.250	1.525	878.5	489.5	167.34	320.96	8.3	8.6	20.16	37.32
	IV	4.778	1.600	1,032.1	552.2	216.02	345.14	9.2	8.8	23.48	39.22
1976	I	5.492	2.928	2,479.3	1,573.7	451.44	537.45	19.4	13.7	23.27	39.23
	II	4.974	1.801	2,223.2	823.8	446.96	457.43	22.7	12.9	19.69	35.46
	III	5.513	1.572	854.9	475.2	155.06	302.29	7.1	7.4	21.84	40.85
	IV	4.921	1.726	1,117.1	642.9	227.00	372.46	10.0	8.4	22.70	44.34
1977	I	5.366	2.928	1,953.7	1,523.0	364.08	520.14	15.7	11.6	23.19	44.84
	II	5.153	1.853	3,341.8	920.8	648.52	496.95	28.9	12.7	22.44	39.13
	III	5.419	1.671	1,157.9	605.5	213.66	362.38	9.0	8.4	23.74	43.14
	IV	4.724	2.061	1,072.0	699.8	226.92	339.52	9.3	7.3	24.40	46.51
1978	I	5.929	3.449	2,495.2	1,715.7	420.84	497.44	18.0	10.7	23.38	46.49
	II	5.416	2.312	3,542.3	1,124.4	650.72	486.32	28.0	10.8	23.24	45.03
	III	5.641	2.151	1,159.5	702.0	205.54	326.35	8.4	8.1	24.44	40.29
	IV	5.074	2.397	1,219.8	975.9	240.41	407.13	9.3	8.2	25.85	49.65
1979	I	5.502	4.094	2,379.2	2,077.2	432.43	507.38	16.6	10.3	26.05	49.25
	II	5.145	2.749	3,994.2	1,334.1	776.32	485.30	30.6	9.9	25.37	49.02
	III	5.190	2.547	1,459.0	889.6	281.12	349.27	7.6	7.7	36.99	45.36
	IV	5.008	2.615	2,139.7	1,302.9	427.25	497.90	10.5	9.7	40.69	51.33

Note: Some figures may not compute exactly due to rounding.
Source: Quarterly Tourist Surveys.

portion is worth further analysis as we move into the 1980s.

The pattern of expenditures across categories indicates a proportionate shift away from transportation and gifts towards food and entertainment expenditures. This probably reflects the relatively small increases in air fares and entertainment prices. The amount of transportation needed for a Florida vacation is probably fairly stable; thus if its cost declines relative to other expenditure categories (Table 10) the share of the tourist dollar devoted to it may decline. In the case of entertainment the tourist may be purchasing more in response to the relatively small price increases in this industry.

The impact of rising energy prices has not substantially affected the volume of Florida's tourists over the past five years. As energy prices continue to escalate, however, Florida may suffer a short-run reduction in the number of tourists. Yet it is likely that in time Florida tourists will adjust to changes in relative prices by purchasing less of the most costly items and substituting other goods and services in their place. For example, a United States or Canadian citizen may substitute a Florida vacation for an overseas one if travel costs continue to climb. The market economy has a great ability to reallocate resources in an efficient manner if given time to adjust.

The authors believe Florida will continue to depend on tourism and that the tourist industry can expect to grow significantly as the population of the United States matures demographically and continues to seek leisure activities in warm, sunny locations. In addition, the potential markets of Europe and South America are only beginning to be realized. Florida vacations have become economically attractive in western Europe and Latin America and it appears that only a trickle of the possible traffic is currently occurring.

> ***. . . the impact of rising energy prices has not substantially affected the volume of Florida's tourists over the past five years . . . . The market economy has a great ability to reallocate resources in an efficient manner if given time to adjust . . .***

Benefits and "Disbenefits"

Tourism's Impact Is Not All Positive

. . . the most obvious benefit from Florida's tourist industry is the employment opportunity it provides for the Florida labor force . . .

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and

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The tourist industry provides a number of obvious economic benefits to Floridians. Chief among these are employment opportunities and the increased income induced both by expenditures of tourists and the industry which directly serves them. Tourists also contribute to state and local tax revenues, and the industry provides a cost-effective means of information-gathering for those migrating into the state. Tourist expenditures also help finance cultural and entertainment activities that the resident economy could not sustain unaided.

The industry also imposes disbenefits on Floridians, however. The seasonal nature of tourism imposes job and earnings losses on its employees and these losses may increase the demands on such public expenditures as unemployment compensation and the various income maintenance programs. In addition, the presence of tourists may impose disbenefits on the residents of the state. For example, the increase in the number of automobiles creates more congestion on streets and highways. This causes traffic delays, increases the frequency of accidents, and requires an expansion of police patrols. If a sufficient amount was invested in streets and highways to eliminate congestion, the opportunity cost of the tied-up capital would be excessive during the offseason when the roads are underutilized.

This article examines the quantitative importance of some of the major benefits and disbenefits from the tourist industry, concentrating on the major issues because the task of evaluating all possible benefits and disbenefits would be enormous. As a result, no conclusion is reached on the magnitude of the net social contribution from Florida's tourist industry. Rather, we hope to contribute to the public understanding of the benefits and disbenefits Florida receives from the industry.

The most obvious benefit from Florida's tourist industry is the employment opportunity it provides for the Florida labor force. The U.S. Travel Data Center estimates that about one out of every eight jobs in Florida is due to tourist expenditures (see Table 1). These jobs are created directly in the front-line industries such as hotels, restaurants, personal services, and transportation. These industries in turn create additional jobs by their purchases from suppliers in the state. The employment so created has a multiplier effect on the general level of employment as goods and services are produced to meet the consumption needs of those directly or indirectly dependent on the tourist industry.

Tourist employment in Florida is second only to California in size. The Florida hotel industry is the second largest in the nation (after California), and only in Hawaii, Nevada, Vermont, and Wyoming is employment in hotels a larger proportion of total nonagricultural employment. Employment in eating and drinking establishments is also large in Florida, but the differences in the definition of this industry across states makes comparisons tenuous.

Regional impact of tourism

It is difficult to obtain data on the regional impact of tourism. The exit-point surveys discussed in our earlier article are notoriously sensitive to the last-day experience of travelers, and many tourists visit several counties. Employment data on industries likely to be most affected by tourist expenditures is perhaps the best indicator available. Table 2 contains such data on three industry divisions likely to be most sensitive to tourism. The data are derived from a source which provides figures by county; the counties have then been aggregated into six regions as described at the bottom of the table.

Of the three industries presented, hotels and other lodging places and amusements

Table 1.—Relative importance of tourist employment to state economies, 1976

	Total non-agricultural employment (in thousands)	Tourist employment (in thousands)	Percent of total nonagric. employment	Hotels and lodging employment (in thousands)	Percent of total nonagric. employment	Eating and drinking place employment (in thousands)	Percent of total nonagric. employment
Alabama	1,205.9	37.9	3.1	10.1	0.8	39.4	3.3
Alaska	171.7	10.3	6.0	3.2	1.9	6.5	3.8
Arizona	758.0	69.1	9.1	18.0	2.4	44.8	5.9
Arkansas	658.0	42.6	6.5	7.6	1.2	25.5	3.9
California	8,120.3	398.2	4.9	93.5	1.2	416.1	5.1
Colorado	974.7	87.9	9.0	18.0	1.8	60.1	6.2
Connecticut	1,238.1	40.4	3.3	6.5	0.5	52.7	4.3
Delaware	236.8	15.3	6.5	1.5	0.6	11.1	4.7
District of Columbia	576.2	41.3	7.2	8.4	1.5	19.9	3.5
FLORIDA	2,782.8	334.9	12.0	72.7	2.6	159.6	5.7
Georgia	1,844.4	81.3	4.4	26.1	1.4	72.4	3.9
Hawaii	349.2	49.4	14.2	13.7	3.9	22.6	6.5
Idaho	290.2	23.2	8.0	4.7	1.6	16.0	5.5
Illinois	4,483.8	130.0	2.9	43.5	1.0	NA	NA
Indiana	2,010.0	61.9	3.1	16.5	0.8	97.2	4.8
Iowa	1,013.7	43.5	4.3	11.5	1.1	54.9	5.4
Kansas	830.8	38.0	4.6	6.8	0.8	41.7	5.0
Kentucky	1,108.9	65.1	5.9	11.5	1.0	45.4	4.1
Louisiana	1,298.1	71.4	5.5	14.4	1.1	53.1	4.1
Maine	373.8	36.1	5.5	5.7	1.5	15.9	4.3
Maryland	1,507.5	62.8	4.3	9.8	0.7	74.8	5.0
Massachusetts	2,309.1	105.6	4.6	19.7	0.9	116.0	5.0
Michigan	3,264.3	135.9	4.2	23.7	0.7	160.0	4.9
Minnesota	1,514.3	139.5	9.2	19.9	1.3	81.8	5.4
Mississippi	727.4	35.6	4.9	7.9	1.1	21.9	3.0
Missouri	1,747.4	101.9	5.8	25.6	1.5	89.0	5.1
Montana	249.2	22.1	8.9	6.1	2.4	16.5	6.6
Nebraska	573.9	28.0	4.9	7.6	1.3	31.4	5.5
Nevada	279.8	45.4	16.2	36.5	13.0	14.5	5.2
New Hampshire	312.0	29.5	9.5	6.3	2.0	15.2	4.9
New Jersey	2,743.4	108.8	4.0	20.4	0.7	116.1	4.2
New Mexico	389.1	34.4	8.8	8.9	2.3	21.0	5.4
New York	6,770.7	196.8	2.9	59.4	0.9	261.4	3.9
North Carolina	2,046.8	91.2	4.5	17.6	0.9	68.8	3.4
North Dakota	214.6	16.2	7.5	3.5	1.6	12.7	5.9
Ohio	4,099.8	120.3	2.9	31.2	0.8	191.8	4.7
Oklahoma	930.7	61.8	6.6	8.6	0.9	47.4	5.1
Oregon	872.3	61.1	7.0	12.1	1.4	50.2	5.8
Pennsylvania	4,491.7	180.7	4.0	47.0	1.0	175.9	3.9
Rhode Island	366.3	9.6	2.6	1.9	0.5	17.1	4.7
South Carolina	1,039.3	66.2	6.4	12.9	1.2	33.3	3.2
South Dakota	219.2	18.2	8.3	3.3	1.5	14.1	6.4
Tennessee	1,577.4	79.3	5.0	19.8	1.3	54.2	3.4
Texas	4,686.9	227.2	4.8	53.0	1.1	211.1	4.5
Utah	462.9	39.5	8.5	6.1	1.3	23.9	5.2
Vermont	168.2	23.5	14.0	7.0	4.2	8.0	4.8
Virginia	1,842.7	87.8	4.8	27.8	1.5	70.8	3.8
Washington	1,267.8	80.2	6.3	13.0	1.0	73.0	5.8
West Virginia	594.1	29.8	5.0	6.0	1.0	17.8	3.0
Wisconsin	1,724.4	99.6	5.8	NA	NA	NA	NA
Wyoming	155.4	17.0	10.9	6.1	3.9	9.7	6.2

NA Not available.
Source: Travel Trends in the U.S. & Canada, 1978.

reflect the expected regional importance of tourism in Florida. Central and southeast Florida have above-average employment in these two industries whereas the other regions are below the state norm. Because these data are derived from counts estimated in March, the summer season regions of northern Florida may be underestimated. The figures for employment in eating and drinking places seem to have no interpretable pattern.

Another source of information on the importance of tourism at the local level is the number of units in hotels and motels.

Table 2.—Employment in eating and drinking places, hotels, and amusements by region in Florida, 1977

	Eating and drinking places (in thousands)	Percent of total nonagric. private employment	Hotels (in thousands)	Percent of total nonagric. private employment	Amusements (in thousands)	Percent of total nonagric. private employment
Northwest	11.6	7.7	3.8	2.5	1.0	0.7
North central	6.9	8.1	2.4	2.9	1.3	1.5
Northeast	11.5	5.3	4.0	1.9	1.9	0.9
Central	31.2	7.4	20.4	4.8	13.0	3.1
Southwest	42.9	8.3	15.9	3.1	9.4	1.8
Southeast	72.4	7.6	42.0	4.4	18.0	1.9
TOTAL	176.4	7.5	88.5	3.8	44.5	1.9

Note: Northwest includes Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Okaloosa, Santa Rosa, Wakulla, Walton, and Washington counties; North central includes Alachua, Bradford, Citrus, Columbia, Dixie, Gilchrist, Hamilton, Hernando, Lafayette, Levy, Madison, Marion, Sumter, Suwannee, Taylor, and Union counties; Northeast includes Baker, Clay, Duval, Flagler, Nassau, Putnam and St. Johns counties; Central includes Brevard, Highlands, Indian River, Lake, Okeechobee, Orange, Osceola, Polk, Seminole, and Volusia counties; Southwest includes Charlotte, Collier, DeSoto, Glades, Hardee, Hendry, Hillsborough, Lee, Manatee, Pasco, Pinellas, and Sarasota counties; and Southeast includes Broward, Dade, Martin, Monroe, Palm Beach and St. Lucie counties. Totals may not add due to rounding.

Source: County Business Patterns 1977 Florida.

Presumably these numbers remain reasonably stable over the year even if the demand varies seasonally. The number of hotel and motel units in each area of Florida is given in Table 3. Of a total of 266,705 units, almost 39 percent are in the southeast, with 25.8 percent in the central region and 19.1 percent in the southwest. Thus, the regions where the tourist industry is primarily located are southeast, central, and southwest Florida. It is instructive to compare the share of a region in hotel and motel units with its share in nonagricultural private sector employment given in the last column of Table 3. The results indicate the greatest relative dependence on the tourist industry by northwest, north central, and central Florida. Hence, although southern Florida has a large tourist industry, it has other major sources of employment and is thus relatively less dependent than the northern part of the state (except for the Jacksonville area) on tourism.

Table 3.—Hotel and motel units by region in Florida, 1979

	Number	Percent	Total employment as % of state total
Northwest	18,989	7.1	6.4
North central	10,904	4.1	3.6
Northeast	13,374	5.0	9.3
Central	68,740	25.8	18.0
Southwest	50,911	19.1	22.2
Southeast	103,787	38.9	40.5
TOTAL	266,705	100.0	100.0

Source: Florida Statistical Abstract 1979, pp. 424-425.

Tourist contributions to state revenues[1]

An important benefit of tourism to the residents of the State of Florida is its contribution to tax revenues. Insofar as this contribution exceeds the additional government expenditures required to service tourists, it represents a source of revenue to the state other than taxes levied on Florida residents. This permits either a higher level of government services than would be possible without tourism, or a lower level of taxes to be paid by Florida residents.

The State of Florida collected $2.9 billion in the 1974-75 fiscal year in the form of taxes, fees, and licenses imposed on consumption, wealth, and income in some form or another. The percentage of revenues accounted for by the various taxes, fees, and licenses in Table 4 shows that almost 80 percent of revenues are in the form of taxes on consumption. An advantage of consumption taxes is that they are levied on consumption

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[1] *This section draws heavily from M. B. Redman, A Study of the Exportability of State Taxes in Florida, Department of Economics, Florida Atlantic University, Boca Raton, Florida, June, 1978.*

Table 4.—Tax, fee, and license revenues, State of Florida, by tax base as a percent of own source, total and general fund revenues, fiscal year 1974-75

Tax base	Specific tax, fee, or license	Percent of total state tax, fee, license revenue		Percent of general fund revenues	
Consumption			78.5		78.0
	Sales/use tax	41.0		61.0	
	Gasoline tax	11.6		0.0	
	Beverage tax/license	6.3		9.1	
	Cigarette tax	6.0		1.5	
	Racing taxes/fees	2.8		2.4	
	Utilities tax	1.6		0.0	
	Special fuel tax Auto road tax	1.0			
	Motor vehicle inspection fees Drivers' license taxes	0.7		1.0	
	Hunting/fishing licenses	0.2		0.0	
	Oil/gas production tax Solid minerals severance tax	1.0		1.1	
	Insurance premium tax	1.7		1.9	
	Citrus fees/taxes Citrus inspection fees	1.2		0.0	
	All other licenses and fees	3.4		0.0	
Wealth			12.1		12.1
	Estate tax	1.2		1.7	
	Intangible tax	2.5		1.5	
	Documentary stamp tax	2.2		3.2	
	Motor vehicle/mobile home licenses	6.0		5.4	
	Auto title/lien fees	0.2		0.3	
Income			9.4		9.5
	Corporate income tax	6.1		9.2	
	Corporate privilege tax	0.2		0.3	
	Unemployment compensation tax	2.9		0.0	
	Workmen's compensation tax	0.2		0.0	
TOTAL			100.0		100.0

Note: Percent column does not add due to rounding.

Source: M.B. Redman, A Study of the Exportability of State Taxes in Florida, Department of Economics, Florida Atlantic University, Boca Raton, June, 1978.

Table 5.—Contribution of tourists to Florida consumption tax revenues

Tax	Tax paid per additional tourist ($)	Total paid by all tourists ($ millions)	Percent of tourist contribution	Total tax collected ($ millions)	Share of tax in total (percent)	Percent paid by tourists
Sales	$ 7.75	$225.70	62.2	$1,322.1	64.6	17.07
Gasoline	2.25	65.39	18.0	354.0	17.3	18.47
Alcohol	1.30	38.06	10.5	106.1	5.2	35.87
Beer	0.56	16.31	4.5	79.8	3.9	20.44
Cigarettes	0.59	17.20	4.8	183.8	9.0	9.37
TOTAL	$12.45	$362.66	100.0	$2,045.8	100.0	17.73

Source: A Study of the Exportability of State Taxes in Florida.

expenditure regardless of the residency of the spender. Thus, tourists will pay some portion of these taxes. The major consumption taxes (sales, gasoline, beverages, and cigarettes) are also the taxes to which tourists can be expected to make their major contribution.

Estimates of the contribution paid by tourists to the five consumption tax revenue sources in 1976 are given in Table 5, which shows the amount of tax paid per additional tourist. Multiplying this by the number of tourists (assuming the tax contributions of the last or marginal and average tourists to be the same) provides an estimate of total tourist contributions to the five taxes. The results show that tourists paid $362 million in these taxes in 1976, or 17.73 percent of the total $2.1 billion collected in that year. By far the

Table 6.—Increase in tax revenues from a 10 percent increase in tourists

	Durden Study 1960-1970	Redman Study 1971-1976
Sales*	15.4	18.6
Gasoline tax	11.9	17.9
Alcohol	21.8	35.6
Beer	19.4	19.2
Cigarettes	21.7	9.4

*Based on quarterly data.

Source: A Study of the Exportability of State Taxes in Florida.

most important tax levied on the expenditures of tourists as well as residents is the general sales tax, which amounted to over 60 percent of the consumption taxes paid by both groups. The most striking difference between the two groups is the higher percentage of tourist tax contributions accounted for by alcohol and the lower percentage accounted for by cigarettes. The implication may be that the average tourist drinks more than the average Florida taxpayer, but smokes less. Alternatively, tourists may smoke cigarettes purchased out-of-state, but drink alcohol purchased in the state.

Table 7.—Comparison of seasonal and nonseasonal occupations by sex and color*

	Same occupation	Out of labor force	Better occupations**	Other occupations	Total
SEX					
Female					
Number	44,962	6,982	3,769	1,118	56,831
Percentage	79.1	12.3	6.6	2.0	100.0
Male					
Number	34,905	5,168	3,886	474	44,433
Percentage	78.6	11.6	8.7	1.1	100.0
COLOR					
Nonwhite					
Number	7,948	1,715	718	0	10,381
Percentage	76.6	16.5	6.9	0	100.0
White					
Number	68,601	9,556	4,488	1,592	84,237
Percentage	81.4	11.3	5.3	1.9	100.0
TOTAL***					
Number	79,926	14,552	7,655	1,592	103,725
Percentage	77.1	14.0	7.4	1.5	100.0

*Sample results were "blown up" using control totals from secondary sources and a local employer survey.

**Occupations were classified using the revised Duncan scale; see Hauser and Featherman, The Process of Stratification: Trends and Analyses, New York: Academic Press, 1977.

***Items may not add to total because of missing information on some questionnaires.

Some idea of the change in the contribution of tourists to tax revenues can be obtained by comparing the results of the Redman study to the work of Durden.[2] Tax elasticities[3] showing the percentage increase in revenues resulting from a 10 percent increase in tourists are shown in Table 6. The sales, gas, and alcohol tax elasticities have increased between the 1960s and 1970s, suggesting that as tourism grows the tourist contribution to these taxes will increase. Since these are the three largest consumption taxes, the results indicate that as the tourist industry expands, the contribution of tourists to state revenues will expand even more rapidly. This makes the tourist industry an attractive target for development assistance on the part of state lawmakers. It should be remembered, however, that a larger tourist industry will place greater demands on government expenditures, and the true net benefit from the industry will be the growth in the excess of tourist contributions to tax revenues over government expenditures.

Social and economic costs of seasonality

The most obvious disbenefits from the tourist industry stem from two basic causes: seasonal fluctuations in the demand for its services, and the stresses imposed on permanent residents by the presence of a substantial inflow of nonresidents. The seasonal fluctuations in demand for the services of the tourist industry cause seasonal fluctuations in the industry's demand for labor.

The significance of the decline in the tourist industry's demand for labor is a complex matter because it depends on the seasonal behavior of the labor force. If the reduction in labor demand during the off season is accompanied by no reduction in labor supply, there will be an involuntary reduction in the number of tourist-related jobs, average weekly hours worked, and average hourly earnings as workers compete for the scarce job opportunities. If the seasonal demand reduction is matched by an equal reduction in labor supply, there will be a voluntary reduction in the number of jobs and average weekly hours, and no reduction in hourly earnings will be required to restore market equilibrium. Reductions in labor sup-

[2] *G. Durden, "A Theoretical and Empirical Analysis of the Relationships Between Tourists and Florida Tax Revenues with Forecasts of Tourists and Taxes for Selected Categories," unpublished doctoral dissertation, Florida State University, Tallahassee, 1973.*

ply during the off season might reflect the desire of some employees to be with their children during school recess, or the desire for vacations. In addition, some employees leave the state during the off season to take advantage of higher earnings elsewhere.

In a study of the southeast Florida hotel and restaurant industry during the 1977-78 tourist season, a sample of employees were asked their occupation and earnings they expected to receive during the following off season.[3] Almost one in four employees expected to leave the industry during the off season and most of these expected to leave the labor force altogether (Table 7). A small number expected to move to better jobs because they were working in the tourist industry while attending school.

A significant proportion of the 77 percent remaining in the same occupation during the off season expected to work fewer hours per week (28 percent) and about one in four expected their average hourly earnings to decline (Table 8). A small number of individuals (managers and chefs) expected their hourly earnings to increase because they were on a fixed salary and their weekly hours are smaller in the off season.

Because average hourly earnings in the tourist industry decline during the off season for many of those remaining in the same jobs, the job losses and reductions in weekly hours that occur are to some extent involuntary. The earnings declines reflect competition for scarce jobs.

Although the involuntary easing of the tourist labor market during the off season may appear to create hardship for some of its employees, the literature on labor economics suggests that this may be alleviated by the payment of compensating wage differentials. This theory, which was first expounded by Adam Smith in 1776, suggests that "undesirable" jobs must compensate their employees for the perceived disadvantages or else go unfilled. There is no evidence on the size of compensating differentials that may be paid by Florida's tourist industry and so we cannot assess the magnitude of the hardship imposed by the seasonality of the industry on its employees.

Table 8.—Differential impact of seasonality by sex and color (percent total employment in the season)

	Job loss*	Hours reduction**	Earnings-per-hour reduction**	Total***
SEX				
Female	20.9	32.3	27.4	80.6
Male	21.4	24.1	22.8	68.3
COLOR				
Nonwhite	23.4	46.7	14.6	84.7
White	18.6	27.1	27.3	73.0
TOTAL	22.9	28.0	25.3	76.2

*This overstates the job loss because it does not allow for new entrants into the occupation during the off season, and for refusals to answer the question.

**This refers to individuals in the same occupation.

***This total is overstated to the extent that those individuals experiencing hours reduction also experience an earnings-per-hour reduction.

A serious question is whether the disadvantage falls more heavily on the less fortunate members of society. The results of the southeast Florida survey show that proportionately more nonwhites than whites expect to leave their jobs in the off season (Table 7). Of those that remain, nearly half will have their hours reduced but the relatively smaller reduction in their earnings per hour suggests a relatively significant decline in the labor supply during the off season (Table 8). On the other hand, many of these employees may be at the minimum wage, and the softening of the labor market cannot legally result in a reduction of their hourly earnings. Hence, they are laid off.

Even if many of these employees are not at the minimum wage, their hourly earnings may be close to their reservation wages, or that amount necessary to induce them to accept employment. The lower paid employees may be strongly influenced by the availability of support from unemployment compensation and income maintenance programs if they leave the labor force. An increased participation in these programs during the off season by employees from the tourist industry imposes a cost on other residents of the state.

Florida's share in the U.S. initial claims for unemployment compensation is higher during the tourist off season than during the season. For example, in September Florida's share is 3.3 percent compared to 2.2 percent in January. In addition, data on the number receiving unemployment compensation who were formerly employed in hotels and other lodging places in Florida show increases during the off season and decreases during the season. The difference between the peak number of claimants during the off season and the minimum number during the season is larger than the annual average number of claimants. These data suggest a major impact of the tourist industry on the unemployment compensation rolls.

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[3] *R. R. Schultz and W. B. Stronge, "The Social and Economic Effects of the Florida Tourist Industry," report submitted to the Florida Department of Community Affairs, November 1978.*

We have been unable to assess the off season impact on income maintenance programs. There may be some increase in those receiving food stamps or training under manpower programs, but there is no evidence that the number receiving AFDC payments increases in the off season.

Congestion, crime and disease

The influx of tourists into Florida expands the number of motor vehicles on the highways, since the majority of tourists come by motor vehicles and many of those who arrive by air also rent cars. This requires public expenditures for highway construction and maintenance, and for associated police patrols. There are also costs due to delays.

Some idea of the substantial nature of the tourist impact on street and highway congestion can be obtained from statistics on motor vehicle accidents. These data show that Florida's seasonal pattern in motor vehicle accidents is the same as the pattern of tourism. The seasonal peak in national motor vehicle accidents is in August, while the seasonal trough is around February. In Florida, the seasonal peak is around February, and the trough is around August.

It could be argued that sufficient public expenditures on street and highway improvements might greatly alleviate the adverse effects of tourist traffic. However, if adequate facilities are provided during the season, they will be excessive in the off season. Hence, there will be an opportunity cost due to the unavailability of those public funds for expenditures elsewhere.

Police expenditures are used to deal with crime, as well as to patrol streets and highways. There are several reasons to expect crime rates to increase during the tourist season. First, criminals may come to Florida for a vacation just like any other group in society. They may engage in criminal activity while in the state. Second, tourists carry personal property with them, and criminals may prey on this property. Third, the population density of tourist resort areas increases dramatically during the tourist season. This provides increased opportunity for criminals at the same time that it provides increased cover for their activities. In addition, the higher population density may stimulate crimes of violence.

Data on U.S. Index crimes have a seasonal pattern that show above-normal incidence in the summer and below-normal incidence in the winter. The Florida data show significant increases in the winter and decreases in the summer, particularly in economic crimes, suggesting that tourism increases the state's crime rate. The residents are adversely affected by this in two ways. They experience a direct loss in so far as they are victims of crimes committed by tourists, and they must finance increased law enforcement expenditures to deal with the additional crime during the tourist season. Tourists finance some of these expenditures through their contributions to taxes, but it is noteworthy that the major beneficiary of these taxes is state government, while the services required as a result of tourism are provided by local governments.

The incidence of disease is also likely to increase as a result of tourism. The mere presence of large numbers of tourists may increase the occurrence and speed of transmittal of highly contagious diseases, especially of the cold and flu variety. Also, a tourist may bring disease into the state and transmit it directly or indirectly (through other tourists) to Florida residents. In either case, residents may incur both monetary and nonmonetary costs as a result. Out-of-pocket medical expenses and perhaps loss of earnings are obvious costs to an individual contracting a disease. In addition, individuals may suffer from a general lack of well-being which may be substantial yet not lead to significant out-of-pocket expenses.

We have not been able to assess the importance of the contribution to disease among residents made by tourists. In part this is due to the lack of a nontourist region that could be compared to Florida. However, one indication is given by the occupancy rate in Florida hospitals.

Table 9 presents hospital bed occupancy rates for the U.S. and Broward and western Palm Beach counties by month for 1976, 1977, and early 1978. The seasonal trend in the three series is high rates of occupancy during the winter months and low rates during the summer. December lies outside the pattern because patients, if possible, avoid hospitalization during the Christmas holiday season and thereby lower occupancy ratios.

The amplitude of the seasonal variation in occupancy rates in south Florida is considerably greater than for the U.S. as a whole. During the winter tourist season, south Florida hospitals experience a heavy demand for their services, while by midsummer their occupancy rates have fallen on average well below the national norm. This rise in occupancy may be due to tourist demand or to resident demand induced by communicable diseases brought to the area by tourists. Since hospital costs are paid either directly or indirectly (through insurance) by users and by taxpayers (hospital taxing districts), this large differential in occupancy rates beyond the normal (U.S.) pattern results in additional costs to residents (and nonresidents) as hospitals seek to cover their fixed expenses. The cost of unused beds during the off season must be carried by all who contribute to the support of hospitals.

Table 9.—Available bed occupancy rates by month for acute care hospitals, U.S. and Broward and western Palm Beach counties, January, 1976-April, 1978

	U.S.	Broward	Western Palm Beach*
1976			
January	77.7	NA	84.5
February	79.9	NA	89.0
March	79.5	NA	83.0
April	76.9	NA	78.6
May	74.3	73.0	72.4
June	74.6	70.0	69.1
July	71.8	68.0	65.6
August	72.2	70.0	67.4
September	72.9	73.0	69.3
October	73.6	73.0	72.8
November	73.5	73.0	78.3
December	68.1	70.0	NA
1977			
January	76.8	83.0	86.1
February	79.0	83.0	85.0
March	78.6	82.0	88.5
April	75.7	75.0	79.6
May	74.4	76.0	76.9
June	73.6	75.0	74.0
July	71.6	72.0	63.2
August	72.7	73.0	62.5
September	73.6	77.0	65.9
October	74.2	80.0	71.5
November	73.8	78.0	75.3
December	68.4	77.0	71.2
1978			
January	77.7	86.0	69.4
February	77.8	88.0	69.4
March	75.9	85.0	70.7
April	75.4	82.0	63.1

NA Not available.

*Includes Boca Raton, Bethesda Memorial, John F. Kennedy, Doctor's, St. Mary's, Good Samaritan, and Palm Beach Gardens hospitals.

Source: U.S. data from Hospitals, Journal of the American Hospital Association, monthly issues; Palm Beach County data from Health Systems Plan 1978-1982 and 1979-1983, Health Planning Council, Inc., West Palm Beach; Broward County data from Medical Facilities, Monthly Utilization Reports, 1977-1978, Health Planning and Development Council, Inc., Broward County.

Summary

The benefits Florida derives from tourism are substantial. One out of eight jobs is estimated to be directly the result of tourism. If indirect and induced employment in the supplying industries were estimated, the importance of tourism to Florida would be even greater. Southeast and central Florida are the dominant tourist regions as measured by hotel and motel and amusement employment. Tourists also contribute approximately 18 percent of state consumption taxes, primarily through the general sales tax.

The disbenefits or costs to Florida associated with the tourist industry are also significant. The effect of seasonality in tourist demand on Florida employment is substantial. Unemployment, especially in the frontline tourist industry, mirrors this seasonal demand. In addition, hours worked and earnings per hour of employees who remain employed during the off season fall, implying an involuntary cutback in labor supply and earnings. Florida also feels the disbenefits of tourism in increased traffic congestion and the resulting rise in motor vehicle accidents, increased economic crimes, and the overexpansion of hospital facilities.

The net benefit of tourism to Florida, although an intriguing concept, would be almost impossible to determine in economic and social terms. The point to be made, however, is that substantial benefits and disbenefits exist, and that Florida policymakers, businessmen, and residents should be aware of both in their assessments of Florida's future development.

Impact of International Tourism

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International tourism in Florida offers a vast growth rate potential, as shown by the steady increase in this market during the 1970s. According to United States Travel Service (USTS) figures for 1975 there were 601,727 international visitors arriving in Florida; in 1976 there were 729,210, an increase of 21.2 percent. The increase from 1977 to 1978 was almost 40 percent, to 1,171,886. These figures do not include Canadian visitors, who numbered 2,000,000 in 1978, increasing 25 percent over 1977.

The authors' study was the first attempt to gather statistics on international tourism in Florida and is intended to give the tourism industry a better picture of who the international visitors are in order to better prepare for their needs.

Florida Director of Tourism Edward Gilbert, in looking at Florida's future in tourism, has stated:

> In analyzing the trends from the past five years, I feel that we are on the right track as we now progress toward opening marketing offices outside the state of Florida, and more importantly, outside the continental United States. With the inception of these offices, which will be complete by September 1980, I feel we can continue to grow at an even larger pace than we have over the past five years and this will be due to the continuing daily contact with the industry in Europe, South America and Canada.

Table 1.—International visitor arrivals in Florida by continents and selected countries of origin, 1978

	1978	Percent change 1977-78
Total visitors (excludes Canada)	1,171,886	39.3
Canada (includes auto, air and charter visitors)	2,000,000	25.0
Continents		
South America	447,663	47.1
Europe	263,559	49.5
West Indies	246,295	26.8
Central America	135,667	24.4
Asia	24,706	51.8
Oceania	6,091	30.7
Africa	5,793	26.8
Selected countries		
Venezuela	181,745	60.0
United Kingdom	99,340	46.6
Colombia	86,382	30.6
Germany	53,685	61.7
Argentina	53,528	74.7
Jamaica	46,322	22.3
Mexico	42,109	33.3
Brazil	28,678	47.6
France	26,418	44.2
Spain	12,987	85.7
Switzerland	12,722	29.6
Netherlands	12,364	72.7
Italy	9,923	13.0
Sweden	8,826	53.4
Belgium	6,447	47.6
Austria	4,261	59.9
Portugal	665	30.6

Source: U.S. Department of Commerce, United States Travel Service, Foreign Tourist Arrivals by Selected States- and Ports-of-Entry Calendar Year 1978, January, 1980.

This article was taken from "An Analysis of the Economic Impact of International Tourism to Florida" prepared for the Florida Department of Commerce, Division of Tourism as the final report of a STAR grant from the State University System of Florida. The complete document and tables are available for $10 from the project coordinator at the University of South Florida College of Education, FAO 226, Tampa 33620

According to the United States Department of Commerce, it is projected that the tourist market will continue to increase; i.e., the foreign vacationers will outnumber the business travelers. The foreigner's concept of America's vacation value, says the department, has changed from that of a "high cost" country to a place where visitors can experience a "relaxing vacation." A decline in the value of the U.S. dollar and relatively inexpensive flights both offer an impetus to increased travel to the United States from foreign countries.

Research limitations

Statistics which follow are incomplete inasmuch as their compilation was restricted by a limited budget. Thus, while 93 percent of international visitors arrive and depart via air, a small percentage is omitted due to arrival by automobile from neighboring states, or arrival by ship. Limited resources prohibited the sampling of these two groups. Foreign travelers were interviewed before boarding international flights. Visitors arriving in Florida via domestic airlines or departing internationally via an airport outside of Florida are omitted, creating another limitation.

For the purpose of this analysis international visitors do not include Canadians. Rather, in looking at Florida's future in tourism, arrivals from Europe, South America and the Middle and Far East have been considered.

Survey methodology

Tampa and Miami international airports were the interview sites for international visitors awaiting departing nonstop flights. Quotas for the number of interviews at both ports of entry were based on air traffic volume. Due to increased costs, the intended sample size was reduced from 4,000 to 2,000. Professionals from a Miami marketing research organization conducted the interviews.

A precondition was that the visitor had to have been in Florida for at least twenty-four hours. Questions, in the language of the departing visitor (in English, German, French

Table 2.—Top ten Latin American and overseas countries of origin of foreign visitors to Florida

Fourth quarter 1978	Percent	First quarter 1979	Percent
Latin America			
1. Venezuela	27.5	1. Venezuela	53.1
2. Guatemala	15.5	2. Guatemala	7.5
3. Mexico	12.5	3. Antilles Islands	5.2
4. El Salvador	11.7	4. Dominican Republic	4.9
5. Colombia	7.4	5. Colombia	4.6
6. Honduras	3.2	6. Mexico	3.6
7. Ecuador	3.2	7. Costa Rica	2.0
8. Argentina	2.6	8. Honduras	1.6
9. Belize	2.5	9. Nicaragua	1.6
10. Dominican Republic	2.5	10. Haiti	1.6
Overseas			
1. West Germany	37.0	1. West Germany	33.1
2. France	29.0	2. England	23.3
3. England	11.4	3. France	20.0
4. Netherlands	2.3	4. Netherlands	4.8
5. Switzerland	1.3	5. Switzerland	3.3
6. Sweden	0.8	6. Sweden	1.9
7. Austria	0.7	7. Austria	1.7
8. Belgium	0.7	8. Northern Ireland	1.7
9. Saudi Arabia	0.7	9. Italy	1.2
10. Scotland	0.7	10. Norway	0.9

Table 3.—Top ten destinations of Latin American and overseas visitors to Florida

Fourth quarter 1978	Percent	First quarter 1979	Percent
Latin America			
1. Dade	81.5	1. Dade	80.5
2. Orange/Osceola/Walt Disney World	28.7	2. Orange/Osceola/Walt Disney World	29.0
3. Hillsborough	7.5	3. Broward	9.1
4. Broward	6.4	4. Hillsborough	3.9
5. Pinellas	1.9	5. Palm Beach	1.6
6. Collier	1.3	6. St. Lucie	1.6
7. Palm Beach	1.1	7. Pinellas	1.3
8. Escambia	0.9	8. Volusia	1.0
9. Sarasota	0.6	9. Marion	1.0
10. Monroe	0.6	10. Sarasota	0.7
Overseas			
1. Dade	58.0	1. Dade	57.9
2. Orange/Osceola/Walt Disney World	26.1	2. Orange/Osceola/Walt Disney World	28.1
3. Broward	15.3	3. Broward	19.5
4. Monroe	7.8	4. Palm Beach	8.2
5. Hillsborough	7.5	5. Monroe	6.9
6. Palm Beach	6.2	6. Hillsborough	6.5
7. Pinellas	5.5	7. Pinellas	4.5
8. Collier	4.4	8. Sarasota	4.4
9. Sarasota	3.7	9. Lee	2.7
10. Brevard	2.3	10. Volusia	2.2

or Spanish), were reviewed by the interviewers.

Prior to the interviews, permission was requested from airport aviation authorities as well as from various airlines. Interviewers, wearing identifying badges, randomly approached visitors as they awaited their departing flights.

The questionnaire was developed by the Florida Department of Commerce/Division of Tourism staff in English and was translated into French, Spanish and German. Since little is known about the international visitor to Florida, the questionnaire was designed to gather information on origins and destinations of visitors, behavioral characteristics, and demographics and expenses.

Number of international visitors:

Table 1 shows final 1978 international visitor totals divided by continents and selected countries, as well as the percentage increase over 1977 visitor totals.

Noteworthy are the 49.5 percent increase in European visitors for 1978 and the 47.1 percent increase in South American visitors.

Venezuelans constituted the majority of arrivals, with a visitor increase of 61.6 percent in 1978.

From the European area, a 46.6 percent increase from 1977 to 1978 in visitors from the United Kingdom was recorded. While Germany is below the U.K. in number of visitors, its visitor traffic rose 61.7 percent in one year. In actual numbers the Netherlands might not be very high, but there was an increase of 72.7 percent; Spain, also small in numbers, showed a phenomenal increase of 85.7 percent.

In Tables 2 and 3 the foreign visitor's origin and destination in Florida is examined, taking into consideration the top countries of origin. Among Latin Americans, we see that Venezuelans arrive more frequently during the winter months between January and March, during the heat of that country's summer. On the other hand, Mexicans prefer Florida between October and December.

During the two quarters of comparison, European visitors were consistent. West Germany, France and England showed low fluctuations, although percentages are lower for the first quarter of 1979.

Table 3 shows that a large percentage of Latin Americans choose to visit Dade County, while overseas visitors select Broward County (Fort Lauderdale), Monroe County (Key West), Palm Beach County and Pinellas County. Both segments, although not in large numbers, choose Sarasota as a destination and all visitors are equally interested in Orange/Osceola counties and

Table 4.—Expenditures by foreign visitors to Florida

(in U.S. dollars)

	Latin Americans		Overseas visitors	
	Fourth quarter 1978	First quarter 1979	Fourth quarter 1978	First quarter 1979
Transportation	12.14	24.05	13.76	16.92
Gasoline	4.71	7.08	5.34	5.44
Food (grocery)	11.20	15.36	7.60	5.97
Food (restaurant)	25.97	35.40	21.54	23.08
Lodging	34.25	46.59	32.34	45.07
Entertainment	19.59	30.41	10.36	13.28
Gifts	69.65	67.42	33.92	24.50
Other	7.51	8.39	5.29	5.61
Expenditure/party/day	$185.02	$234.70	$130.15	$139.87
Size of traveling party (mean)	2.3	2.9	1.8	2.0
Expenditure/person/day	$80.44	$80.93	$72.31	$69.94
Number of days in Florida (mean)	12.1	13.5	17.4	20.0
Expenditure/person/trip	$973.32	$1,092.55	$1,258.19	$1,398.80
Number of visitors	247,000	386,900	112,000	105,850
Total expenditures	$240,410,040.00	$422,707,595.00	$140,917,280.00	$148,062,980.00

Table 5.—Characteristics of visitors to Florida from major foreign tourist-generating countries, January-May, 1979

	Spanish speaking	English speaking	West German speaking	French speaking
Sex				
Male	72.4%	68.8%	81.1%	69.5%
Female	27.6	31.2	28.9	30.5
Age				
0-18	4.2%	3.0%	0.0%	0.6%
19-24	15.3	6.8	5.3	4.7
25-35	24.1	20.1	17.4	20.1
36-49	34.5	39.9	33.2	45.5
50-64	16.3	22.0	22.5	21.9
65 and over	5.5	8.2	21.7	7.2
Marital status				
Married	74.0%	68.7%	61.3%	68.2%
Single	22.6	19.5	21.1	18.1
Other	3.4	11.8	17.6	13.7
Occupation				
Professional, executive	63.9%	43.7%	36.4%	25.5%
Manager, white collar	18.5	30.8	26.5	37.6
Blue collar	4.3	4.9	2.4	14.0
Student/homemaker/military	7.0	4.0	11.2	7.9
Retired/semiretired	1.7	11.5	17.6	11.8
Unemployed	0.3	0.6	1.9	*
Other	4.3	4.5	4.0	3.2
Income				
$0,000-$4,999	5.9%	4.3%	3.8%	1.4%
$5,000-$9,999	8.8	6.5	4.6	3.6
$10,000-$14,999	6.5	9.8	13.3	6.1
$15,000-$19,999	8.1	12.8	13.8	11.5
$20,000-$24,999	10.7	14.9	8.9	17.6
$25,000-$29,999	12.1	11.1	13.8	14.3
$30,000-$34,999	9.4	9.3	10.8	7.5
$35,000-$39,999	25.5	31.3	30.9	31.2
$40,000 and above	13.0	*	*	6.8
Prior planning time (median months)	2-3	3-6	1-2	2-3
Planning organization				
Travel agent	75.5%	73.0%	72.4%	73.0%
Airline	22.2	23.2	24.1	23.0
Other	2.3	3.8	3.5	4.0
Number of nights in Florida (mean)	13.5	19.1	24.3	15.4
Purpose				
Vacation	70.4%	62.1%	56.1%	58.1%
Personal	10.4	2.8	2.1	3.2
Company or governmental business	5.2	14.8	12.8	10.8
Personal business	8.8	3.5	0.3	2.9
Purpose (continued)				
Convention/conference/trade show	2.3	2.6	4.8	5.0
Visit friends or relatives	6.8	22.7	31.0	24.7
Cruise	0.0	0.5	0.8	1.2
Size of traveling party (mean)	2.9	2.0	1.7	2.1
Type of lodging used				
Hotel/motel	59.3%	68.9%	55.6%	69.9%
Campground	1.6	0.7	0.8	0.0
Trailer park	3.9	0.5	0.0	0.7
Condominium	22.5	2.6	3.5	1.8
Friends or relatives	22.8	33.3	48.3	24.4
Other	1.3	5.9	2.1	1.8
Made advance reservations for lodging	38.4%	53.6%	36.6%	53.4%
Used package plan	5.5%	17.6%	11.2%	22.6%
Rented a car in Florida	46.3%	49.5%	44.1%	44.8%
Repeat visitors	76.0%	42.2%	48.8%	39.1%
How long since last visit to Florida				
6 months	60.4%	33.5%	7.5%	12.2%
1 year	23.4	30.1	19.5	11.1
2 years	4.7	15.9	9.4	9.0
3 years	4.7	7.4	5.9	2.5
5 years or more	6.4	11.4	5.3	3.2
Activities enjoyed in Florida				
Rest and relaxation	35.2%	24.1%	58.0%	62.0%
Beaches	31.9	67.9	69.8	71.7
Water sports	5.9	23.7	16.6	25.4
Sports to watch (baseball, football, auto racing)	2.6	3.7	0.8	1.8
Golf	3.6	5.6	2.9	2.2
Tennis	7.5	8.4	5.9	5.7
Fishing, boating	3.6	6.3	8.0	4.7
Camping	2.6	3.0	9.1	3.9
Florida attractions	34.9	45.0	32.4	61.6
Pari-mutuels	2.3	1.9	0.3	0.7
Cruises	5.2	9.4	11.0	12.5
Dancing, night life	15.6	8.0	2.9	4.7
Cultural or special events	0.7	5.2	8.6	15.8
Historical sites	2.0	3.5	5.6	3.2
Educational programs/exhibits	2.9	2.3	2.1	1.1
Shopping	35.5	NA	NA	NA
Will return to Florida	96.9%	92.0%	92.2%	90.3%

NA Not included in questionnaire.
*Less than 0.1 percent.

their attractions, including Walt Disney World.

Tourist expenditures

A changing economy, such as increased spending for gasoline and for food in grocery stores and restaurants, reveals a vast difference in Latin American expenditures between the fourth quarter of 1978 and the first quarter of 1979. Table 4 examines the changes, showing more money spent on entertainment, transportation and lodging as well as an increase per party, per day.

For other overseas visitors, Table 4 shows one significant change. During the first quarter of 1979 expenditures on gifts decreased while lengths of trips increased.

There are interesting differences between the Latin American and other overseas visitors. Latin Americans spent $10 to $20 more on entertainment on a daily basis than did the other group. Latin Americans also spent more for food at grocery stores and restaurants, especially during the first quarter of 1979. And they spent more than twice the amount on gifts than other overseas visitors: $69 vs. $33 in the fourth quarter of 1978 and $67 vs. $24 for 1979:1.

While Latin Americans stay an average of two weeks in Florida, other overseas arrivals remain around three weeks.

By combining all statistics, an "average" international visitor to Florida emerges. The typical foreigner visitor is probably male, between 36 and 49 years old, a married executive with an income between $35,000 and $40,000. His vacation was planned at least two months in advance through a travel agent and he plans to stay in a hotel/motel. The typical visitor has visited Florida before and is particularly interested in the state's attractions and relaxing on the beaches.

Beyond the "average" visitor, Table 5 displays differences. The largest percentage stay in hotels/motels, but quite a few stay with friends or relatives. One exception is the Spanish-speaking visitor, who often stays in condominiums.

Almost half of all foreign visitors rented vehicles between January and May, 1979, an increase of 10 percent among all groups polled in the fourth quarter of 1978.

Economic impact of international tourism

Tourism, a growing, vital area within the United States economy, accounts for over four million American jobs. According to the International Economic Report of the President (1977), almost $100 billion worth of expenditures in 1976 supported these jobs. Also in 1976, 17.5 million foreign visitors accounted for one-twentieth of all U.S. tourism expenditures, generating more than 300,000 jobs with payrolls of almost $2 billion. The Travel Data Center reports that every $26,000 of tourism expenditures generates one job. Figures for Canadian visitor expenditures in Florida during 1978 show that the $650 million spent supported thousands of jobs in this state.

In considering the economic impact of international tourism, it is necessary to look at the difference in the numbers of international visitors arriving in Florida over a recent five-year period.

Year	Visitors	Percent increase
1974	**563,517**	
1975	**601,727**	**6.8**
1976	**729,210**	**21.2**
1977	**802,685**	**10.0**
1978	**1,130,139**	**40.8**

There has been a phenomenal increase in international travel. The number of international visitors doubled in five years. Increased travel means increased travel dollars, affecting both the balance of payments and the number of American jobs generated.

Recommendations

International visitors appreciate information on various subjects in their own language. European travelers, for example, are accustomed to seeing directional signs at airports, railway stations, etc. in several languages, including Japanese. Brochures about resort areas, health spas and attractions are always available in at least four languages. Written guides to various areas, whether official or published by private enterprise, also are geared toward the international traveler. Shops list dress/clothes sizes available in the sizes of other countries: i.e., British sizes are different from the ones on the European continent, although the European Common Market is now changing this somewhat.

Customs of various nations should be taken into consideration when planning for specific groups.

On the other hand, American culture and customs must be explained to the visitor, and an educational program, via publicity and public relations efforts in target areas, should widen the visitor's perspective of what to expect upon arrival in Florida.

The chairman of Pan American World Airways, William T. Seawell, has reiterated the importance of travel for cultural reasons:

> International tourists . . . want to visit places of historical interest, to inspect the treasures of the past, to gaze at interesting scenery, to experience events of cultural interest, to sense distinctive foreign life styles.

ATTRACTING THE FOREIGN TOURIST

Bienvenidos
Willkommen
Bienvenu
歡迎

Ann C. Pierce

Managing Editor
Dimensions

In the postwar decades of the strong dollar and the affluent American, U.S. tourists headed in large numbers to see Europe and enjoy bargain vacations.

Now the tide is reversing itself as European tourists begin taking advantage of vacation bargains in this country purchased with strong marks, francs and guilders.

The State of Florida has geared up to meet the burgeoning new foreign demand for Florida vacations. A Division of Tourism branch office will open late this year in Europe, probably in London; a Canadian branch was expected to open in Toronto this month; and a Coral Gables office to handle the Latin American tourist market opened last November 15. This growth reflects the surge of overseas visitors to Florida. In 1978, international arrivals were up 41 percent over the previous year.

The state's international tourism administrator, Janet Gay, says the European market has "mushroomed" and "the United Kingdom has gone absolutely wild."

Orlando's WFTV Channel 9 recently sent a crew to Europe and presented a five-part report on foreign tourism in Florida, noting that more than 20,000,000 international travelers are expected to visit the U.S.A. this year — more than twice as many as a decade ago.

Kevin Baird of WFTV says travel statistics show that the western United States is still the preferred destination for foreign travelers, with one-third of all arrivals heading there. New York and the "eastern gateway" are a close second, but Florida and the Southeast are coming on strong.

Characterizing the types of foreign tourists attracted to Florida, the WFTV script reported that "the French tourist . . . is definitely not designed for . . . family-based entertainment . . . They are — by and large — not married . . . rarely stay put in one place . . . and avoid travel agents and package tours like the plague."

The German tourists, on the other hand, "seem designed for Disney. They're big spenders, bring their families and arrange their holidays through travel agents.

"Europeans and Latins may be the most recognizable international vacationers," the script pointed out, "but far and away the Canadians are Florida's bread and butter."

The state's international tourism administrator agrees. "We've always had a good market in Canada, our largest foreign market," says Gay.

But international tourism promotion for Florida is of fairly recent origin. The Division of Tourism began its international effort in the middle seventies with a one-man office in Tallahassee. The staff has now grown to four.

The division sponsored European marketing trips in 1977 and 1978 for Florida entrepeneurs to meet with European travel agents and wholesalers. Two private firms — National Airlines and Sea World — took over the "Florida Fever" trip in 1979, with a group of thirty-two representatives.

For the 1980 trip in March, the state joined National and Sea World as third cosponsor for a mission of sixty-five Florida representatives who met with top wholesalers and tour operators in London, Frankfurt, Amsterdam, Paris and Zurich. Gay expects this mission to continue annually, with possible expansion into Scandinavia and Latin America.

"We got a lot of very favorable comments in Europe," she said. "We hit 'em and we hit 'em hard. It was a very successful promotion."

Coordinator Richard Weaver of Sea World said the "Florida Fever" show included seminars for European travel agents and media representatives, booths and exhibits from different areas of Florida as well as attractions, and a show with singing, dancing, music and photo projections. "A real working blitz," he called it.

In addition to Florida Fever, the state's international promotion efforts for the past year included participation in these events:

International Tourism Borse (Berlin, Germany) — Europe's largest tourism industry trade show with more than eighty-eight countries participating.

Southeastern States Teach-In (London, Birmingham, Glasgow) — a gathering intended to create an environment within the United Kingdom conducive to packaging and selling Florida entertainment centers to tour operators and wholesalers.

Travel Trade Workshop (Montreux, Switzerland) — one of the premier shows in Europe for international tour operators and travel representatives.

Florida Huddle — an annual sales seminar for the Florida tourism industry coordinated by the international section and designed as a high-level marketplace to put international buyers in touch with the leading suppliers of the state's tourism products in a professional and businesslike atmosphere. The January, 1980, Huddle generated more than $117 million in new business — a 75 percent increase over the 1979 Huddle.

Governor's Conference on Tourism (Key West) — the twelth annual conference last October highlighted international tourism.

Discover America Travel Organization Pow Wow (New Orleans) — a sales seminar for 2,000 delegates who heard Governor Bob Graham speak at a luncheon hosted by the State of Florida.

Florida Familiarization Tours—visits to key Florida attractions and regions arranged by the international tourism staff for foreign travel counselors, wholesalers, and retail agents from Europe, South America and Canada.

Private promotions

Private attractions in Florida are beginning to move into specific foreign promotions as well. Researchers Barbara Lutz and Elizabeth Finn (see preceding article) identified the top overseas-visitor drawing cards among Florida's major attractions in early 1979. As might be expected, Disney World was the leader, with 42.6 percent of the overseas travelers in Florida visiting it in the first quarter last year. Other rankings for that quarter were Miami Seaquarium, with 24.3 percent; Everglades National Park, 20.6; Kennedy Space Center, 19.7; Sea World, 9.8; Busch Gardens, 8.4; Parrot Jungle in Miami, 8.4; Vizcaya, 4.8; Cypress Gardens, 4.3; and Circus World, 2.7. The preferred list was slightly different for the Latin American visitor, with Disney and Miami Seaquarium still first and second, followed in order by Parrot Jungle, Sea World, Busch Gardens, Circus World, Monkey Jungle, Vizcaya, Lion Country and Miami Serpentarium.

How do these attractions individually aim at the foreign traveler?

. . . the State of Florida has geared up to meet the burgeoning new foreign demand for Florida vacations . . . . Private attractions are beginning to move into specific foreign promotion as well . . .

the state's top foreign-visitor attractions

WILLKOMMEN
bienvenida
WILLKOMMEN
APPA
bienvenu
GENIESSEN
WILLKOMMEN
MEN
MARVILLOSO
willkommen
VENU

CIRCUS WORLD: The main thrust of this Haines City attraction is direct contact with major wholesalers and tour operators through trade shows and direct sales presentations, says James T. Medick, sales director. Circus World has been represented at the Canadian National Exposition consumer show, the "Florida Huddle," state-sponsored trips, and "Florida Fever." Target countries have included Canada, Germany, France, Britain and the nations of South America. Within the attraction, signs, maps and informational brochures are printed in Spanish, French and German. Circus World advertises in "International European Magazine."

CYPRESS GARDENS: With a new $5.5 million expansion, Cypress Gardens began 1980 with a 112 percent increase in international tourism over 1979. Of all the international tours for January, 67 percent were Latin American. Brenda Carter de Treville, communications director, says the gardens are promoted overseas with films; tourism expositions; exchanges of animals with Costa Rica, Uruguay and Brazil; and a foreign ski show and water ski competition in Brazil. At the attraction there are brochures and boat-ride and welcome tapes in French, German, Spanish and Portuguese. A multilingual staff is provided for German, French and Spanish speakers and foreign flags are flown to welcome international visitors.

DARK CONTINENT (Busch Gardens): Foreign visitation here has doubled since 1978, reports Glenda Gilmore, publicity manager. Most international visitors come from Canada, with other foreigners representing only 1 percent of all visitation. With the opening of a hotel at the Dark Continent this year, the attraction expects to become far more attractive to foreign visitors. On a long-range basis the Continent is aiming at Latin American and European travelers and recently opened a sales office for these markets in Miami. In the park, rack brochures and question-and-answer sheets have been converted to Spanish, as have directional signs. The Dark Continent press kit is also being converted to Spanish.

EVERGLADES NATIONAL PARK: The third largest park in the national system, designated as a UNESCO biosphere reserve, the Everglades is considered an "absolute necessity" on most foreign visitors' itineraries in Florida, according to Pat Tolle of the park public relations office. The park does no advertising, either foreign or domestic, and at present the staff is bilingual only in Spanish. Restrictions on funding and staff prevent development of specific programs or translations for foreign visitors of the cards, maps and brochures available in English.

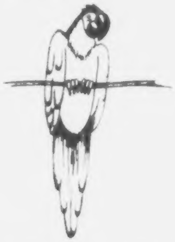
KENNEDY SPACE CENTER: Visitors from more than sixty countries have been logged on the center's bus tours to view America's achievements and programs in space as well as the historic launch sites and buildings, reports George Meguiar, manager of public relations and advertising. Not a tourist "attraction" but rather an operational base involved in the launching of communication, weather, and other scientific and space probes, the center is looking ahead to the launching of the space shuttle which is expected to attract some of the huge crowds and world press representation drawn by the original manned launches. To attract foreign visitors now the center advertises in international publications; provides tours in German, French, Italian, Spanish and Portuguese; cooperates with the overseas offices of the U.S. Travel Service and the "Info Road" operations in Canada and Mexico; hosted T.V. personalities from six major South American countries for weekend television presentations, in cooperation with Braniff Airlines; has participated in promotional trips to Canada for five years and has exhibited annually at the three-week Canadian National Exhibition. Brochures are supplied to overseas travel wholesalers, foreign and domestic.

LION COUNTRY SAFARI: Opened in 1967, this attraction west of West Palm Beach was the first African wildlife park in the country. Lions, elephants, rhinos and other animals roam free in a 300-acre drive-through natural habitat. An entertainment area offers boat tours past chimp and bird islands, a train ride through a wild deer forest, jeep rides, a petting village, a reptile park and display of lifesize replicas of prehistoric beasts. Ama Dubell, public relations and marketing director, says Latin visitation has increased every year and "we are trying to meet our visitors' needs." Signs, brochures and safety rule cards are printed in Spanish and English. The attraction advertises every week in Miami's Spanish-language newspaper and occasionally on the city's Spanish radio station. Lion Country also hosts visiting journalists from Spain and South America and distributes brochures to Latin tour wholesalers and travel agents.

MIAMI SEAQUARIUM: International tourism promotion has been going on a long time at this twenty-five-year-old attraction — ever since a market survey in the summer of 1960 revealed that 12 percent of visitors there were from Latin America, Western Europe and Canada even though no special effort was then being made to attract them. An overseas news release and photo program which began then has continued ever since according to Burton Clark, attractions division director for the Seaquarium's parent corporation, Wometco Enterprises, Inc. By 1965, thirty-two international airlines were distributing foreign-language Seaquarium brochures and supplying them to travel agencies and tour operators. Five sound-and-color promotional films have been produced with language narration in French, Portuguese, German, Spanish and Japanese. Visits to the Seaquarium by well-known personages such as Japanese Crown Prince Akihito, the presidents of West Germany and several Latin American countries, and popular entertainers are featured in releases to international news media. Clark says the language barrier between international visitors and American citizens and businessmen is becoming "a problem of greater magnitude each year" in south Florida. The Seaquarium maintains a reserve list of well-educated people speaking a total of twenty-two languages and at any one time the attraction's staff includes one or more persons who can communicate in five or more major languages.

MIAMI SERPENTARIUM: Both a laboratory and an attraction, this thirty-three-year-old reptile garden grew out of the hobby of owner-director William Haast. He and his wife, Clarita, public relations manager, have cut their advertising budget this year to concentrate on experimental research in the treatment of incurable human diseases with snake venom. Many foreign visitors are among those watching the Serpentarium's chief attraction, the regular milking of 1,200 venom-producing snakes. Foreign and domestic press and television journalists regularly seek out the Haasts for specials, documentaries and news interviews. Clarita says there are no bilingual guides besides one who speaks Spanish, but says visitors come to watch rather than listen.

MONKEY JUNGLE: Though one of the top-ten attractions for Latin visitors, this Miami operation does no individual promotion and provides no foreign language brochures or assistance other than a single Spanish-speaking guide. Mary DuMond, manager, says she has noticed an increase in recent years in visitors from Europe, Japan, the United Kingdom, French Canada and, particularly, South America.



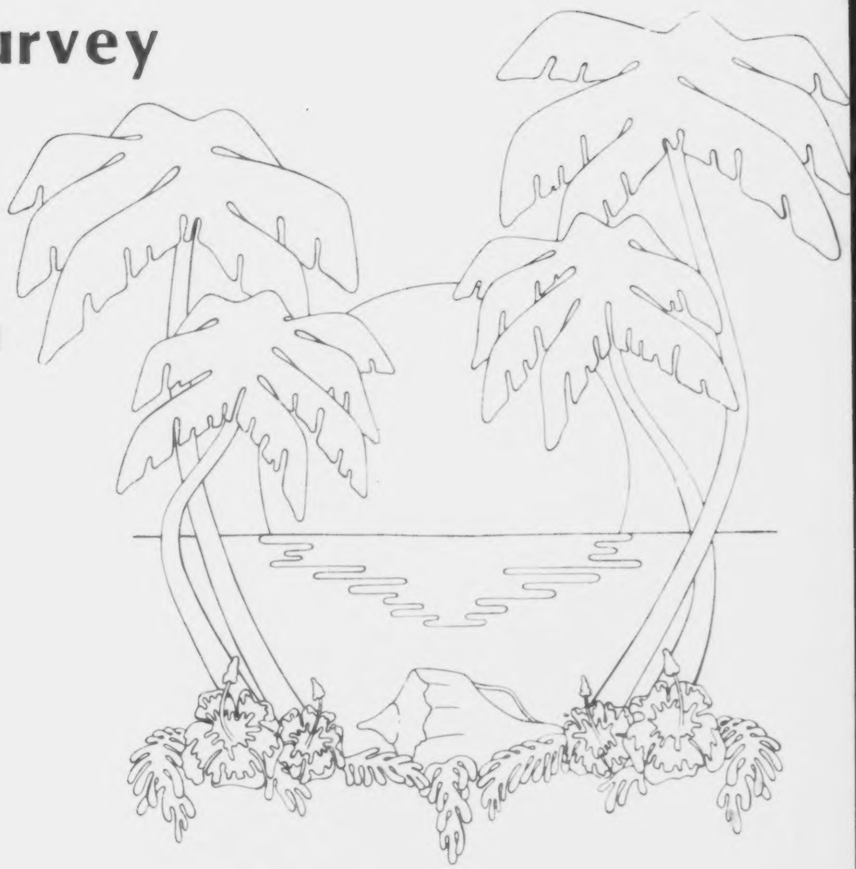
PARROT JUNGLE: Fully half of this Miami attraction's 500,000 visitors annually are international tourists, according to marketing manager Pat Callan. Calling it unique in its appeal to Europeans, Callan says the jungle is promoted by South American travel agents and tour packagers along with the Seaquarium as one of the top two attractions in Miami. From the fourth quarter of 1978 to the first quarter of 1979, it moved from eighth to seventh on the list of the top ten overseas-visitor attractions in the state. It ranked third with Latin visitors in 1979:1, moving up from fifth. Parrot Jungle's marketing organization relies on promotions through tour operators and travel agents in Europe and Latin America rather than on any direct advertising. Within the park, maps are available in French, German, Spanish and Portuguese and rack cards have been printed in Spanish.

SEA WORLD: Open only since 1973, this central Florida attraction started its marketing forays into South America and Canada about six years ago, according to its public relations manager, Richard Weaver. In the last two years the Western European market has boomed. "When devaluation (of the dollar) took effect, we were inundated by visitors and Western European press and television people, reporters, editors, cameramen," he says. Noting that a vacation in Florida for a family of four is for the first time affordable from Europe, Weaver says "We're seeing a tremendous surge. Our international business is probably up 100 percent over this time last year, even though the total foreign trade business is only about 5 percent of our total visitation." Sea World participated in the state's 1978 promotional tour to Europe and became a cosponsor in 1979. Weaver coordinated the expanded 1980 "Florida Fever" trip to five European cities to sell Florida. Sea World's print advertising is minimal, mostly aimed at family and convention business through foreign trade publications.

VIZCAYA: Word of mouth and general advertising in local tourist publications for arriving foreign visitors have brought a "very large" number of international tourists to Vizcaya museum and gardens in Miami, reports Doris B. Littlefield, research curator. The attraction has not undertaken any direct overseas advertising because many international tour operators with offices in Miami, as well as various airlines, have worked up their own advertising or magazine articles featuring Vizcaya. Canadian newspaper syndicates and several foreign magazines have solicited information for articles they published about the museum. At the site, bilingual volunteer guides give daily tours in French and Spanish. Tours are available by appointment in German and Portuguese and informational brochures and guide leaflets are printed in French, Spanish, German and Portuguese.

WALT DISNEY WORLD: The number of European visitors to the state's top attraction was up 100 percent in 1979 over the previous year according to Rod Madden, publicist, who says more and more foreign charter flights are now coming to the Orlando area as a first destination in Florida. Of WDW's 14,000,000 visitors in 1979, about 1,120,000 or 8 percent were foreign, and of these, fully three-fourths were Canadian. WDW international promotion does not include media advertising but is conducted through personal contact by staffers who spend several weeks a year in major foreign capitals; by special promotional trips often held in connection with inaugural flights by foreign airlines to Florida; occasionally by participation in travel-trade shows and state-sponsored tours; and by arrangements for foreign press visits to WDW. Word of mouth or a newsworthy activity at Disney World account for much of its overseas publicity. Several dozen foreign TV crews visit every year and Madden says a half dozen foreign print media representatives can be found at the Magic Kingdom in any given week. Basic brochures and press kits are available in French and Spanish. Many groups have their own guides, but bilingual staff guidance is available most days in Spanish, French and German, while speakers of other languages can be accommodated with advance notice.

a benchmark survey of travel to and through Florida



Ralph Thompson

Editor
Dimensions

Every five years the United States Bureau of the Census conducts a national travel survey in connection with the Census of Transportation.

Information is obtained on nonlocal travel from a national probability sample of approximately 25,000 housing units representing the total noninstitutional population of the United States. In 1977, each household was interviewed at three-month intervals to develop a record of all trips taken by household members during that year.

Nonlocal travel was defined as any trip extending 100 miles or more from origin to destination. Excluded were (1) travel taken as part of an operating crew on a train, plane, bus, truck or ship; (2) commuting; (3) travel by students between home and school; and (4) travel by the armed forces while on active duty. Because these data are estimates based on a sample survey, they are subject to sampling error. Full details of the sampling

Table 1.—Households and persons taking trips to and through Florida, 1972 and 1977

	1972 Number (000s)	1977 Number (000s)	Percent change 1972-77
Households taking trips	6,636	9,031	36.09
Persons taking trips	14,978	19,972	33.34
Person-trips	24,485	34,204	39.69
Person-nights	166,157	202,246	21.72
Person-trips:			
Vacation trips	14,716	21,192	44.01
Nonvacation trips	9,137	12,900	41.18
Don't know	633	113	---
Persons/household	2.26	2.21	---
Trips/person	1.63	1.71	---

Source for all tables in this article: U.S. Bureau of the Census, National Travel Survey, Travel During 1977, pp. 226-27.

Table 2.—Size of party, age, sex, and time of year of trips taken by persons traveling to and through Florida, 1972 and 1977

	1972		1977		
	Number (000s)	Percent	Number (000s)	Percent	Percent change 1972-77
TOTAL	24,485	100.00	34,204	100.00	39.69
Number of persons					
1	6,016	24.57	10,289	30.08	71.03
2	8,146	33.27	12,331	36.05	51.37
3 or more	10,323	42.16	11,584	33.87	12.22
Age					
Under 18	5,620	22.95	7,247	21.19	28.95
18-24	1,898	7.75	3,356	9.81	76.82
25-54	11,373	46.45	15,976	46.71	40.47
55-64	2,959	12.08	4,284	12.52	44.78
65 and over	1,712	6.99	3,340	9.76	95.09
No answer	923	3.77	0	0.00	NA
Sex					
Male	11,969	48.88	17,474	51.09	45.99
Female	11,416	46.62	16,730	48.91	46.55
No answer	1,100	4.49	0	0.00	NA
Quarters					
First	5,[illegible]14	23.34	8,976	26.24	57.09
Second	7,0[illegible]7	28.70	8,858	[illegible]5.90	26.06
Third	6,897	28.17	9,784	28.60	41.86
Fourth	4,847	19.80	6,586	19.26	35.88

NA Not applicable.

Table 3.—Mode and purpose of trips taken by persons traveling to and through Florida, 1972 and 1977

	1972		1977		
	Number (000s)	Percent	Number (000s)	Percent	Percent change 1972-77
TOTAL	24,485	100.00	34,204	100.00	39.69
To destinations					
In Florida	23,323	95.25	28,230	82.53	21.04
In other states*	1,162	4.75	5,974	17.47	414.11
Mode of transportation					
Auto/truck without camping equipment	16,557	67.62	23,349	68.26	41.02
Auto/truck with camping equipment	1,754	7.16	1,993	5.83	13.63
Bus	326	1.33	678	1.98	107.96
Train	137	0.56	263	0.77	91.97
Airplane	5,378	21.96	6,608	19.32	22.87
Other	332	1.36	1,314	3.84	295.78
Purpose					
Visit relatives and friends	8,312	33.95	12,769	37.33	53.62
Business, convention	4,320	17.64	4,730	13.83	9.49
Outdoor recreation	2,267	9.26	3,623	10.59	59.81
Entertainment and sightseeing	5,768	23.56	7,281	21.29	26.23
Other	3,817	15.59	5,801	16.96	51.98

*Includes trips to destinations outside the United States.

process and the errors involved can be found in the source.

The average trip to Florida taken by a typical tourist

The modal trip to Florida in 1977 was taken by a party of two people vacationing together. They were between the ages of twenty-five and fifty-four. They came in the summer and traveled in an automobile or truck without camping equipment. Their main purpose was to visit relatives or friends. They traveled 2,000 miles or more to get to Florida and return home again. They spent from four to nine nights away from their home, which was located somewhere in the South. According to a supplementary survey made by the U.S. Travel Data Center, the average cost of a trip to Florida in 1977 was $384.23.

The head of the household making this journey was a married, white, employed white-collar worker with an income of from $10,000 to $14,999. The household took about two trips a year.

Changes in travel patterns from 1972 to 1977

Thirty-six percent more households took trips to Florida in 1977 than in 1972. The number of persons going on these trips increased slightly less but the number of trips increased slightly more, as can be observed from the data in Table 1. Persons on these trips spent only one-fifth more nights in Florida in 1977 than in 1972, indicating that the trips' length was not being extended to the same degree as the trip frequency. The number of one-person trips increased by the greatest amount, while trips by parties of three or more grew at the slowest rate, as recorded in Table 2.

Changes in the age distribution of persons taking trips to Florida are not great. Young adults have increased by 77 percent and persons over sixty-five by 95 percent. It must be remembered that these data in Table 2 are for person-trips and since some individuals took more than one trip during the year, there are more such person-trips than there are individuals.

A better job was done in getting information on sex in 1977 than in 1972, as the "no answer" category was eliminated. When percentages of those who reported themselves as either male or female in 1972 are computed, disregarding the "no answers," they are almost identical with those for 1977 — 51.18 for males and 48.82 for females. Winter and summer seasons gained a higher percentage of visitors than spring or fall from 1972 to 1977.

Characteristics of travelers to and through Florida

Table 3 shows data about trips taken rather than the persons taking them. Although the basic unit (one person-trip) is the same, significant differences are indicated by the great increase in the number of persons going through Florida to other states. Since, as the footnote indicates, this includes trips to destinations outside the United States, this is some indication of the importance of Florida air and seaports to persons going abroad.

Although efforts by Amtrak to increase train travel have paid off in a 92 percent increase in such travel to Florida from 1972 to 1977, buses have done even better. The use of automobiles with camping equipment has not grown as rapidly as other modes but this compares with the slow growth in the number of person-trips made by children under eighteen, as indicated in Table 2. The source gives no clues as to what mode of transportation is meant by "other" — motorcycles or bicycles perhaps.

Although visiting friends and relatives was still the number one purpose for taking a trip to Florida, the percentage of visitors coming for outdoor recreation grew by the greatest amount.

Where visitors come from, how far they travel, how long they stay

One-third of all person-trips were for 2,000 miles or more and about one-third were for 599 miles or less. The median in

Table 4.—Distance, duration and origin of trips taken by persons traveling to and through Florida, 1972 and 1977

	1972			1977				
	Number (000s)	Percent		Number (000s)	Percent		Percent change 1972-77	
TOTAL	24,485	100.00		34,204	100.00		39.69	
Round-trip distance								
200-399 miles	4,122	16.83		7,652	22.37		85.64	
400-599 miles	3,342	13.65		4,279	12.51		28.04	
600-799 miles	1,923	7.85		1,907	5.58		-0.83	
800-999 miles	1,094	4.47		2,041	5.97		86.56	
1,000-1,999 miles	3,235	13.21		6,115	17.88		89.03	
2,000 miles and over	10,394	42.45		11,798	34.49		13.51	
Outside U.S.	376	1.54		413	1.21		9.84	
Duration of trip								
No nights out of town	2,107	8.61		2,220	6.49		5.36	
16 nights or more	2,439	9.96		3,713	10.86		52.23	
Region of origin								
New England	862	3.52	21.47	1,059	3.10	18.23	22.85	18.58
New York, New Jersey	2,543	10.39		2,744	8.02		7.90	
Mid-Atlantic	1,852	7.56		2,431	7.11		31.26	
South	14,080	57.50		21,681	63.39		53.98	
North central	4,251	17.36		4,757	13.91		11.90	
Northwest	91	0.37		190	0.56		108.79	
Southwest	526	2.15		928	2.71		76.43	
Pacific	280	1.14		414	1.21		47.86	

1977 was 1,082 miles. There was a great increase from 1972 to 1977 in the number of trips lasting sixteen nights or more. In 1977 the median duration was 5.6 nights away from home.

Not only was the South the greatest source of person-trips in both 1972 and 1977, but the number of trips originating in that area increased by more than 50 percent.

Heads of households taking trips

Promoters of tourist travel to Florida might be interested in knowing the characteristics of heads of households who came to this state in 1977. As indicated by Table 5, there were 9,031,000 households taking a total of 18,885,000 trips to Florida and spending 202,246,000 person-nights in the state. A person-night means one night spent by one person en route.

More than one-fifth of the person-nights spent by households going to and through Florida were accounted for by persons who have retired. Another one-third were people classified as not in the labor force or unemployed. These could be students, housewives, nonretired persons who live off rents or investments, as well as persons who have been laid off or who are on strike.

One might suspect that households with incomes of $20,000 or more would account for a much higher percentage of person-nights than those with lower incomes. However, as the data in Table 5 indicate, the 35.1 percent of the households in this group take 37.6 percent of the trips and account for 37.7 percent of person-nights.

Travel by Floridians in 1977

Almost fifteen million trips were taken in 1977 by persons who started out from Florida. They were part of over eight million households and they spent twenty-seven million person-nights en route. Of these, two-thirds of the households and persons traveled to destinations in Florida and they spent over nine-tenths of the person-nights that were spent en route by these travelers.

Some five million of the fifteen million person-trips were made to destinations outside Florida and these people spent just under two million person-nights in Florida while en route. (See Table 6.)

It would be interesting, of course, to know where these travelers from Florida to destinations outside the state went, but the Census Bureau doesn't analyze the characteristics of persons whose trips originated in Florida—only those of persons who traveled to or through Florida. Undoubtedly the samples for many states would be so small that the sampling errors would be high enough to render the results useless. We know that 84.91 percent of all person-trips to and through the South and 74.09 percent of person-trips to and through Florida were made in automobiles with or without camping equipment. It might be safe to assume an 80 percent figure for residents of Florida traveling outside the state. This would mean that about four million person-trips would be made by car and would, therefore, go to or through Alabama and Georgia.

Data supplied by the Florida Department of Transportation indicate that average daily northbound traffic at highway exits to Georgia totaled about 22,000 in 1978. Traffic to Alabama was perhaps 9,000 to 11,000. This would indicate that perhaps two-thirds of the person-trips from Florida go to or through Georgia and one-third to or through Alabama. The estimated amounts would be 2,668,000 person-trips to or through Georgia and 1,334,000 to or through Alabama.

There were 14,265,000 person-trips to or through Alabama in 1977 from the nine southern states and 22,641,000 to or through Georgia. After eliminating person-trips which originated in these states, it would seem that Florida tourists contributed about 22 percent of the total person-trips going to or through each of these two states.

Since 49 percent of all the trips to and through Alabama went beyond that state and 44 percent of the trips to and through Georgia went beyond we might assume that these percentages apply to person-trips from Florida. If that is true we could estimate that 651,000 of the person-trips leaving Florida for Alabama and 1,174,000 of the trips leaving for Georgia had destinations beyond these adjacent states.

Beyond these data, estimates of the ultimate destinations of person-trips from Florida cannot be made from the information available in the Census of Transportation.

Table 5.—Characteristics of heads of households taking trips to and through Florida, 1977

	Households taking trips		Household trips		Person-nights in Florida	
	Number (000s)	Percent	Number (000s)	Percent	Number (000s)	Percent
TOTAL	9,031	100.0	18,885	100.0	202,246	100.0
Race						
White	8,451	93.6	17,475	92.5	194,244	96.0
Black and other	581	6.4	1,411	7.5	8,003	4.0
Spanish origin	135	1.5	229	1.2	2,040	1.0
Age (median)	44.9	(X)	43.9	(X)	43.6	(X)
Education						
Elementary or less	921	10.2	1,417	7.5	48,465	24.0
High school	3,996	44.2	7,819	41.4	87,582	43.3
College	4,113	45.5	9,648	51.1	66,199	32.7
Marital status						
Married	6,674	73.9	14,167	75.0	125,356	62.0
Separated	188	2.1	354	1.9	1,684	0.8
Widowed or divorced	1,541	17.1	2,994	15.9	22,106	10.9
Single	816	9.0	1,725	9.1	22,563	11.2
Head employed	6,763	74.9	14,311	75.8	132,328	65.4
White-collar	4,341	48.1	9,995	52.9	91,023	45.0
Blue-collar	1,827	20.2	3,320	17.6	33,326	16.5
Service workers	458	5.1	758	4.0	6,093	3.0
Farm workers	137	1.5	237	1.3	1,887	0.9
Head not in labor force or unemployed	2,268	25.1	4,574	24.2	69,918	34.6
Retired	1,286	14.2	2,324	12.3	41,947	20.7
Other	982	10.9	2,250	11.9	27,971	13.8
Income						
Under $5,000	855	9.5	1,727	9.1	18,318	9.1
$5,000 to $7,499	742	8.2	1,455	7.7	16,698	8.3
$7,500 to $9,999	773	8.6	1,320	7.0	16,083	8.0
$10,000 to $14,999	1,988	22.0	4,211	22.3	39,312	19.4
$15,000 to $19,999	1,500	16.6	3,069	16.3	35,555	17.6
$20,000 to $24,999	1,264	14.0	2,735	14.5	25,913	12.3
$25,000 to $49,999	1,673	18.5	3,784	20.0	40,786	20.2
$50,000 and over	237	2.6	585	3.1	9,581	4.7
Median	15,524	(X)	16,189	(X)	16,505	(X)

Table 6.—Travel by Floridians: trips originating in Florida by destination, 1977

	Household trips		Person-trips		Person-nights in Florida	
	Number (000s)	Percent	Number (000s)	Percent	Number (000s)	Percent
TOTAL	8,286	100.00	14,967	100.00	27,213	100.00
To destinations						
In Florida	5,585	67.40	9,830	65.68	25,361	93.19
In other states (spent one or more nights in Florida)	537	6.48	1,032	6.90	1,852	6.81
Passed through Florida	2,164	26.12	4,105	27.43	NA	NA

NA Not applicable.

Florida's Competition:

How Other Southeastern States Attract Tourists

As indicated in the previous article by Professor Thompson, little information is available about the destinations of travelers from Florida headed outside the state. What the data do show is that approximately 66 percent of the almost fifteen million trips taken by persons who started out from Florida were to Florida destinations. As this indicates that Floridians who vacation nearby are a sizeable market, the editors decided to investigate what Florida represents to neighboring states as a tourist market and what, if anything, is being done in these states to attract the Florida tourist. The information below was gathered in telephone conversations with tourism-promotion agencies in other states in the region.

Photograph by Clay Nolen, courtesy of North Carolina Department of Commerce, Division of Travel and Tourism.

Georgia

The Georgia Tourist Division this year presented its third annual two-month spring advertising campaign to attract out-of-state tourists. Although in past years the advertising effort has been directed to other parts of the country, this year it aimed at areas within a 250-mile radius of Georgia, a "one tankful of gas" distance, according to Hannah Ledford of the Georgia Department of Industry and Trade's Tourist Division.

For marketing purposes, the Tourist Division divides the state into seven travel regions. Promotional material describes the attractions in each and offers suggestions for gasoline-economical vacations within each. The Division does not plan to repeat its 1979 gasoline availability survey this year, as the situation has improved. There is concern, however, about the new credit limitations and their effects on the use of gasoline credit cards, Ledford said.

The theme for the 1980 campaign is "Georgia—This Way to Fun." Advertising has included two Sunday newspaper supplements and television and radio spots. In Florida, the campaign is running in Tampa-St. Petersburg, Orlando, and Jacksonville. The regional nature of Georgia's campaign is evident in one television spot shown in Florida this spring with the slogan, "Other states can only border on this much fun." According to Barbara Leigh Pijot of Rafshoon Advertising, the commercial also ran in North Carolina, South Carolina, Alabama and Tennessee, encouraging tourists who formerly passed through Georgia to make the state their end-destination. The Florida "snowbirds" or seasonal residents heading home were another target of this year's campaign.

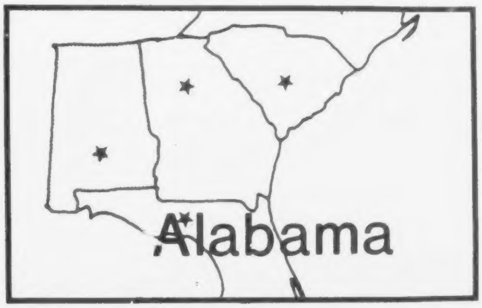
Historically, Florida is one of the top ten states in the number of inquiries received by the Georgia Tourist Division. Preliminary estimates provided by Polly W. Hein of the University of Georgia's Division of Services

Greg Kerber

Editorial Assistant
Dimensions

indicate that 5,092,000 Floridians traveled on Georgia highways for vacation or recreation purposes in 1979. While data are not complete at this time, it is estimated that Georgia was the major destination of 1.6 million or approximately 31 percent of these Florida travelers.

Tourist Division research indicates that Georgia's mountains are the main attraction for Florida tourists. Other Georgia attractions targeted here are cosmopolitan Atlanta and historic Savannah, promoted as offering cultural, historical and metropolitan appeals distinctive from those of Florida cities. Two other major Georgia attractions — the beaches and the Okeefenokee Swamp — are not emphasized in advertising here because of Florida's own Everglades and miles of beaches.



Alabama's tourist marketing also shifted to a regional emphasis last year. Most Alabama tourism originates in the South: in 1979 there were 4,900,000 trips into the state from other southern states. Florida tourists accounted for 6.6 percent of these trips into Alabama during 1979.

Media advertising is used to attract tourists to Alabama; however, there are no radio or billboard campaigns in Florida at present. Television advertising on satellite station WTBS in Atlanta provides some Florida coverage.

Advertising for Alabama Tourism and Travel Development has been handled by Steiner Bressler Advertising since last year. Cy Steiner of the agency says marketing efforts will be increased in Florida. The 6.6 percent trip origination figure indicates that a matching percentage of the advertising budget should be spent on the Florida market, said Steiner.

The theme for the 1980 campaign is "Alabama the Beautiful". New promotional material shows a strategy similar to that in Georgia's promotions: the state is divided into twelve vacation areas, promoting gasoline-economical vacations within each. No gasoline survey or hotline operations are planned at present, but the situation is being closely watched and plans will be made as warranted.

North Carolina

Data for the first quarter of 1980 show tourism in North Carolina up over the same period last year. As in Georgia and Alabama, a heavy emphasis is placed on regional marketing. Lane Nash, administrative assistant at the North Carolina Travel and Tourism Division, says the state ran a six-week spring newspaper advertising campaign in cities within 300 miles of the state's borders—again, "one tankful of gas" away.

The gasoline situation concerns the Travel and Tourism Division, but officials feel availability is more important than price to the tourist. The price per gallon will have to reach $2.50 before tourists will abandon their vacation plans altogether, Nash said. In the meantime, tourists cope with rising gas prices by giving up several long-weekend trips and saving instead for a combined ten-day to two-week vacation. Plans are underway at the Travel and Tourism Division to establish a toll-free telephone number to provide gasoline-availability and other information to prospective tourists.

The Travel and Tourism Division is not advertising in Florida now. The mountains are the traditional attraction in North Carolina for Florida tourists, Nash stated, and many hotels and other businesses, particularly in the Asheville area, advertise directly in Florida.

Dick Trammell of the Asheville Chamber of Commerce reports that Florida is always among the top two or three sending states for summer tourists, according to statistics gathered at their Visitor Information Center. The large number of Florida residents with summer homes in North Carolina is also an important part of the area's tourist industry.

The Chamber of Commerce has marketed specifically to Florida in the past, but is not presently involved in a Florida media campaign due to budgetary restraints. Efforts are being made to attract conventions and tour business. In addition to direct advertising, local hotels and businesses contribute to marketing the area by donating services instead of cash support. On a recent weekend, twenty-six Miami travel agents were given a promotional tour of the area.

Advertising by the Chamber has traditionally been regional rather than national; past efforts have centered mostly in the Southeast and the Midwest. At this time, marketing efforts are being directed toward residents of North Carolina, encouraging vacations within the state.

South Carolina

Of the nearby states, South Carolina probably competes most directly with Florida for tourists since South Carolina's marketing efforts focus on the state's beaches and coastal areas.

Gene Dickson of Leslie Advertising reports that the bulk of South Carolina's tourist advertising is in regional editions of thirteen national magazines, targeted to areas within a 500-mile radius of South Carolina's coastal resorts — Georgia, North Carolina, Maryland, Virginia, and West Virginia. As in the other states contacted, South Carolina's marketing efforts have shifted from a national to a regional coverage in the recent past.

Gasoline availability concerns the South Carolina tourist industry too. The Division of Tourism conducts surveys of service stations and releases to the media weekly reports on the percentages of stations that will be open during the weekend, according to Rachel Haynie.

While South Carolina does not aim specifically at the Florida market, the state benefits from the travel corridor between the Northeast and Florida. Estimates provided by Brenda Thomas of the Division of Tourism for fiscal year 1978-79 show 1,680,964 tourists from Florida with a destination of South Carolina, and 3,926,937 tourists from Florida with other destinations spending at least one night in South Carolina. While it is difficult to gauge the number of Florida-bound tourists who pass through the state, some indication is found in data from the Florida Division of Tourism, which estimates that in 1978 New York and Pennsylvania alone accounted for 2.6 million automobile tourists coming to Florida.

While Florida's neighboring states are marketing to the tourist from Florida, efforts continue here to encourage instate vacations. According to Ron Miller of the Florida Division of Tourism, public service announcements and billboard advertising are used in promotions of Florida vacations for Floridians.

A publicity campaign scheduled for May and June of 1980 is providing articles on "circle tours" within various regions of the state, encouraging Florida residents to "see all of Florida," said Miller. "The variety in the state provides almost unlimited opportunities for vacations within the state."

The Division of Tourism believes that gasoline supplies will be ample this summer. The increasing cost of fuel, however, will encourage Floridians to vacation in their home state.

FLORIDA OUTLOOK
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Travel

Sources of Tourism Information

Frances W. Terhune

Associate in Research
University of Florida

How many tourists come to Florida each year? How much money do they spend? How long do they stay? How much money is collected in taxes from tourists? What is the economic effect of tourism in south Florida? in central Florida? in the panhandle? Are the tourists who visit Miami different from the tourists who head for the west coast or for Disney World?

All the above questions are important for the many Floridians who depend on tourists to make a living, for the government planners who depend on tourist dollars to boost the economy, and for everyone who lives in this state where tourism is one of the main industries. Many of the answers for specific years can be found in articles in this special Tourism issue of *Dimensions*.

But what about other years and hundreds of other questions that arise when tourism is studied?

Information on tourism is not always easy to find. There is much information related to tourist activity, but putting it together and reaching definite conclusions requires care and caution. For example, how does one separate the money spent by tourists in restaurants, department stores, gasoline stations, etc., from the money spent by resident Floridians? How does one calculate the multiplier effect of the tourist dollar as it moves through the economy? How can the tourist cars and campers tallied by traffic counters be distinguished from those of Florida residents going about their normal business?

This article describes some of the federal, state, and private agencies and publications offering information and/or analyses of Florida tourism. The list presented here is by no means definitive. Readers who know of tourism information not discussed in this article are encouraged to write to the author. Updates on sources of information on various economic and demographic topics are presented regularly in *Dimensions*.

In the *Florida Statistical Abstract*, in Section 19.00 on Tourism and Recreation, the staff of the Bureau of Economic and Business Research, University of Florida, attempts to collect as much tourism information as possible and to present a summary of available data. This section of the *Abstract* can also serve as a bibliography of available tourism sources because most of the sources contain more information than can be presented in the limited space.

The University of Central Florida has recently organized the Dick Pope Sr. Institute of Tourism Studies, a research development center for the state's tourist industry.

At least two business research centers at out-of-state universities issue reports which contain data for Florida. The Division of Research, College of Business Administration, University of Georgia, publishes *The Georgia Travel Industry* and the Business Research Division at the University of Colorado issues *Travel Trends in the U.S. and Canada* ($25.00). The Colorado center sponsors The Travel Research Association and publishes the quarterly *Journal of Travel Research* (subscription $25.00 per year). A recent article in the *Journal* dealt with "The Reactions of Travelers to Gasoline Rationing and to Increases in Gasoline Prices." The chairperson of the Florida chapter of The Travel Research Association is Harold J. Roberts, Southeastern Academy, 2333 East Space Coast Parkway, Drawer 1768, Kissimmee 32741.

The Department of Habitational Resources at the University of Wisconsin-Stout publishes quarterly the *Annals of Tourism Research* (subscription $20.00 per year). Future issues will deal with the sociology of tourism, the geography of tourism, and the management of tourism.

Florida Division of Tourism

The primary state agency producing information about tourism and tourists is the Office of Marketing and Research in the Florida Division of Tourism. This office conducts a quarterly survey of tourists and releases the results in a series of publications. The data include expenditures, mode of travel, origin and destination of travelers, purpose of trips, type of lodging, demographics of travelers (age, income, sex), things people like about Florida, income and occupation of travelers, etc. This and other information is available in the following publications:

1976/77/78/79/80 Quarterly Reports	**$2.50/quarter**
1976/77/78/79/80 County Reports*	**$2.50/county/quarter**
1976/77/78/79/80 Canadian Reports	**$2.50/quarter**
1977/78/79/80 International Reports	**$2.50/quarter**
1973/74/75/76/77/78 Executive Summaries (annual summaries)	**No charge**
1979 Florida's Visitor Analysis	**No charge**

*Dade, Broward, Palm Beach, Orange/Osceola, Pinellas, Hillsborough, Duval

Specialized information to meet travel market research needs or information about additional counties may also be available on special order.

In May, 1980, the Florida Division of Tourism cosponsored a tourism research seminar with the Florida chapter of The Travel Research Association on "International Visitors and Emerging Travel Trends . . . Do We Understand Them?" This was part of a seminannual series of seminars designed to bring together segments of the Florida tourism industry in an effort to exchange research information, spot new travel trends, boost marketing results, and promote industry unity.

U.S. Travel Data Center

The U.S. Travel Data Center, established in 1973, is a private, nonprofit research center devoted to travel and tourism. It sponsors and conducts statistical, economic, and scientific research concerning travel, the travel industry and travel-related industries.

Following is a list of some publications of the Data Center. A more complete list can be obtained by writing to the Center.

1977 National Travel Expenditure Study ($25.00): estimates of travel spending by state visited for transportation, accommodations, meals, entertainment/recreation, and incidentals.

1980 Travel Outlook Forum Proceedings ($30.00): a recap of the meeting in November, 1979, of more than 230 travel industry executives to discuss the outlook for travel in 1980, with special emphasis on energy and economic problems affecting the industry.

1979 Quarterly Travel Trends ($10.00 per quarter): a U.S. summary including measures of passenger-miles, receipts, profits, prices, employment, international visitor flows, and visitation at parks and attractions.

The Impact of Travel on State Economies, 1977-78 ($22.00): estimates of the economic impact of travel by state including expenditures, employment, payroll, business receipts, and tax revenue generated by travel.

Survey of State Travel Offices, 1979-80 ($15.00): a report based on questionnaires returned to the Data Center by forty-eight state travel offices providing a detailed picture of the offices' operations planned for fiscal year 1979-80.

1977 National Travel Survey

Every five years the U.S. Bureau of the Census conducts a census of the nation's industrial and business activities covering retail and wholesale trade, selected service industries, manufactures, mineral industries, commercial fisheries, and transportation. The

Census of Transportation consists of four surveys: truck inventory and use, commodity transportation, motor carriers and public warehousing, and national travel. These transportation surveys have been taken in 1963, 1967, 1972, and 1977.

The 1977 National Travel Survey was taken to provide statistical data on the volume and characteristics of trips of more than 100 miles from origin to destination. The survey, based on a national probability sample of households selected from each of the fifty states and the District of Columbia, was planned and sponsored jointly by the U.S. Department of Transportation, the U.S. Travel Service, and the Bureau of the Census.

The results are published in *Travel During 1977* (1977 Census of Transportation: National Travel Survey, TC77-N-2), for sale by the U.S. Government Printing Office (Stock number 003-024-02185-5; price $7.50). The report includes information for the nation as a whole, for eight travel regions, and for the fifty states on the following topics:

- means of transport
- purpose of trip
- recreational activities engaged in
- weekend and vacation travel
- travel to and through states
- number of households and persons taking trips, number of trips taken, person-trips, person-miles, person-nights, and overnight accommodations used
- characteristics of travelers, households, and trips

The travel census provides benchmark information against which other tourist information can be measured and provides a uniform means for comparing tourism in Florida with activities in other states. Elsewhere in this issue of *Dimensions*, in "A Benchmark Survey of Travel to and through Florida," Ralph Thompson analyzes information from the 1977 travel census and presents several tables.

Information on special topics

Reports and publications of various state and federal agencies can provide valuable tourism information even though the collection of the information may have been for purposes entirely unrelated to tourist activities. Some of these sources are listed below:

International travelers. The U.S. Immigration and Naturalization Service issues two reports with information about international travelers. *Immigration and Naturalization Service Reports of Passenger Travel between the United States and Foreign Countries* provides monthly information and seminannual and annual summaries of passenger travel between the U.S. and foreign countries for major U.S. ports. Arrivals and departures to and from forty-nine countries and on cruises are covered.

The *Annual Report of the Immigration and Naturalization Service* also reports on passenger travel between the U.S. and foreign countries by ports.

The U.S. Travel Service (USTS) in the Department of Commerce was established in 1961 to stimulate and encourage travel to the U.S. by residents of foreign countries. USTS distributes and places promotion materials and advertising abroad through the VISIT U.S.A. program. In 1973, the function of USTS was expanded to include the promotion of travel within the U.S.

USTS publishes an annual report entitled *Foreign Tourist Arrivals by Selected States and Ports-of-Entry*. The most recent report, for calendar year 1978, was issued in January, 1980. It includes foreign-visitor business and pleasure arrivals by air and water and by country of residence. Data are reported for Florida and for Ft. Lauderdale, Miami, the Orlando-McCoy Jetport, Tampa, and West Palm Beach.

The Florida Division of Tourism issues two series of quarterly reports — *International Visitor Analysis* and *Canadian Visitor Analysis* — on the number of visitors, origin and destination, expenditures by type, attractions visited, activities enjoyed in Florida, and what other cities or countries outside of Florida were visited.

FLORIDA OUTLOOK
Travel

Hotels, motels, and restaurants. The number of licensed hotels and motels, with number of units, and the number of licensed food service establishments, with seating

> *. . . there is much information related to tourist activity, but putting it together and reaching definite conclusions requires care and caution . . .*

capacity, are reported semiannually by county by the Division of Hotels and Restaurants in the Department of Business Regulation.

Tourist-related sales and tax collections. The Department of Revenue issues monthly and annual summaries of gross sales, taxable sales, and sales tax collections for Florida by eighty-five business categories. These same data are available by county from the Bureau of Economic and Business Research, University of Florida. By selecting tourist-related businesses, some measure of the economic effect of tourism can be charted but the usefulness of these data is limited because they also include sales to nontourists.

Forecasts of tourism. Tourism is one component of the forecasts of economic activity provided to subscribers of *The Florida Outlook* (subscription $125.00 per year), issued quarterly by the Bureau of Economic and Business Research, University of Florida. In March, 1979, the U. S. Travel Data Center published a reference guide to forecasting studies in travel and tourism: *Forecasting Travel and Tourism: An Annotated Bibliography* ($5.00).

Employment in tourist-related businesses. Employment by county in businesses related to tourist activity is available in at least two sources. The Bureau of Economic and Business Research, University of Florida, publishes data for March of each year in the *Florida Statistical Abstract*. These data come from ES-202 forms filed with the Florida Department of Labor and Employment Security for unemployment compensation purposes. The second source is the U.S. Bureau of the Census publication, *County Business Patterns*. The most recent Florida volume published is the 1977 edition.

Traffic counts. The Bureau of Planning in the Florida Department of Transportation issues quarterly and annual reports giving average daily traffic counts on major highways in Florida.

State parks. The Division of Recreation and Parks in the Florida Department of Natural Resources issues monthly and cumulative reports giving attendance at each state park or recreation area. This office reports yearly on the acreage and status of each area.

National park system. The annual *Statistical Abstract*, issued by the National Park Service, U.S. Department of the Interior, publishes information on visits and overnight stays at national parks and memorials in Florida.

Registered boats. The Bureau of Boat Registration in the Florida Department of Natural Resources can provide counts of pleasure boats and commercial boats by county.

Where to find these travel publications

Where does the user find the sources described on these pages? As mentioned earlier, the *Florida Statistical Abstract*, published annually by the Bureau of Economic and Business Research, University of Florida, offers a summary of these data in the section on Tourism and Recreation. The most recently published *Abstract*, 1979, is now out of print but should be available in most Florida libraries. The 1980 *Abstract* should be available in the fall of 1980 from the University Presses of Florida, 15 N.W. 15th Street, Gainesville 32603.

Accompanying this article is a list of addresses and phone numbers of the agencies mentioned in connection with the sources being discussed.

Most of the state publications are available free of charge from the agency which issues them. Supplies are frequently limited and sometimes requests cannot be honored unless they come from other state agencies. The state depository library system makes state publications available in all areas of Florida.

Most federal reports must be purchased from the Government Printing Office (GPO) in Washington, D.C., or from a local GPO bookstore. Publications purchased from the GPO must be paid for in advance or charged to a Visa or Master Charge account. The federal government also maintains a system of depository libraries where federal publications are available.

where to write for tourism information:

BUREAU OF ECONOMIC AND BUSINESS RESEARCH
University of Florida
Matherly Hall 221
Gainesville, Florida 32611
904/392-0171

INSTITUTE OF TOURISM STUDIES
College of Business Administration
University of Central Florida
Orlando, Florida 32816

DIVISION OF RESEARCH
College of Business Administration
University of Georgia
Athens, Georgia 30602

BUSINESS RESEARCH DIVISION
College of Business Administration
University of Colorado
Boulder, Colorado 80309

DEPARTMENT OF HABITATIONAL RESOURCES, TOURISM
University of Wisconsin - Stout
Menomonie, Wisconsin 54751

OFFICE OF MARKETING AND RESEARCH
Division of Tourism
107 West Gaines Street
Tallahassee, Florida 32301
904/488-4952 or 904/488-7641

U. S. TRAVEL DATA CENTER
Suite 610
1899 L. Street, N.W.
Washington, D.C. 20036
202/293-1040

IMMIGRATION AND NATURALIZATION SERVICE
425 I Street, N.W.
Washington, D.C. 20536
202/655-4000

U. S. TRAVEL SERVICE
Department of Commerce
Washington, D.C. 20230
202/377-3811

DIVISION OF HOTELS AND RESTAURANTS
Department of Business Regulation
Room 221, Johns Building
Tallahassee, Florida 32301
904/488-1133

DEPARTMENT OF REVENUE
Room 102, Carlton Building
Tallahassee, Florida 32301
904/488-5846

BUREAU OF PLANNING
Department of Transportation
605 Suwannee Street, Mail Station 210
Tallahassee, Florida 32301
904/488-4318

DEPARTMENT OF NATURAL RESOURCES
Crown Building
202 Blount Street
Tallahassee, Florida 32301
904/488-6286

NATIONAL PARK SERVICE
Department of the Interior
Washington, D.C. 20240
202/343-7394

GOVERNMENT PRINTING OFFICE
Washington, D.C. 20402
202/783-3238

ATLANTA BOOKSTORE: GOVERNMENT PRINTING OFFICE
Room 100 Federal Building
275 Peachtree Street, N.E.
Atlanta, Georgia 30303
404/221-6946

JACKSONVILLE BOOKSTORE: GOVERNMENT PRINTING OFFICE
Room 158
400 West Bay Street
Jacksonville, Florida 32202
904/791-3801

Southeastern states:

GEORGIA
Office of Leisure Studies and Tourism
Attention: Mel Crask
College of Business Administration
University of Georgia
Athens, Georgia 30602

Georgia Department of Industry and Trade
Tourist Division
Post Office Box 1776
Atlanta, Georgia 30303

SOUTH CAROLINA
Director of Tourism
Department of Parks, Recreation and Tourism
Suite 113, Edgar A. Brown Building
1205 Pendleton Street
Columbia, South Carolina 29201

NORTH CAROLINA
Travel and Tourism Division
430 N. Salisbury St.
Raleigh, North Carolina 27611

ALABAMA
Director
Bureau of Publicity and Information
532 South Perry St.
Montgomery, Alabama 36130

FLORIDA OUTLOOK
Travel

LOOKING AHEAD:

AN OPTIMISTIC PRIVATE VIEW

Robert C. Allen

Vice President
Walt Disney World

This article was based on a presentation to The Florida Council of 100 – University of Florida Ninth Annual Economic Outlook Conference on January 7, 1980.

Back in early January when we presented our opinion of the Florida tourism outlook for 1980 our outlook was viewed with skepticism by some members of the audience.

To the casual observer of the Florida tourism industry, that skepticism would seem to be warranted. At that time we were not far removed from the 1979 summer gasoline situation, and the economic outlook was very unfavorable. And, at this writing, the economic outlook has grown even more unpleasant. However, we were looking forward to a good tourism year in Florida for 1980, with an attitude of cautious optimism. Our caution exists because of the possible adversities that may develop which are largely out of the control of the private sector. Our optimism is based on the demonstrated strength of Florida tourism in the face of adversity.

Florida tourism retrospective

Tourism has long been an important element of Florida's economy. During the 1970s tourism in the state has exhibited substantial growth, moving to its current position as the number one industry.

Since 1970, the number of tourists visiting Florida has increased at an average annual rate of 4.6 percent and expenditures by tourists have increased at an average annual rate of 17.1 percent, according to the Florida Division of Tourism.

Using some of the data developed by the division, we find that the number of air and auto visitors has increased from 32.4 million in 1978 to 32.9 million in 1979, a 1.5 percent gain. Total visitation, including overseas arrivals and other modes of transportation, increased from 34.0 million to 35.7 million, a rise of 4.8 percent. Tourist expenditures increased from $12.9 billion in 1978 to $14.6 billion in 1979, a 12.8 percent increase, and state sales tax collections from tourism will increase similarly to a level of $685 million.

Why has Florida tourism been able to show such remarkable growth during the seventies?

There is no single reason that can be given as the answer to that question. We attribute the growth primarily to a combination of reasons that are interdependent. One of the foremost reasons is the changed attitude toward vacationing. Today a vacation is viewed more as a necessity than a luxury, and is generally one of the last things to be eliminated from the family budget. Increased leisure time and increased affluence have been important contributors to the growth of Florida tourism. As people have more vacation time available and their earnings increase, there is a general tendency to take more frequent long-distance vacations.

Another reason is the ease of travel now as compared to previous years. Better air service to Florida and improved interstate highway systems facilitate long-distance travel to Florida by making the journey easier, safer, and more convenient.

Unfortunate as the decline in the value of the dollar may be, it has been somewhat of a stimulus to international tourism to the United States and Florida. The dollar decline has made a Florida vacation an exceptional value to many overseas visitors. More important is that Florida offers what vacationers are looking for. Florida offers practically something for everyone, including good beaches, scenery, clean air, a variety of entertainment, sporting events, historic sites, and relaxation.

There are many other reasons contributing to a strong Florida tourism industry, but probably the most important is the recognition by the people of the state of the importance of tourism and their dedication to keeping Florida a desirable vacation destination.

Factors affecting tourism in 1980

Earlier we described our attitude toward 1980 as one of cautious optimism. This caution is based on the potential development of adversities outside of the control of the private sector.

There are two primary areas of concern that have the potential of developing to the point of having a detrimental effect on Florida tourism in 1980. One area is the state of the national economy, and the other area is gasoline availability.

Over the past several months the economy has experienced a slow-growth type of expansion with rapid inflation. At this writing, it appears that most economists believe we are in the early stages of an economic slowdown. How long the slowdown will last or how severe it will be is a subject to debate with only time giving us the best answer.

A review of Florida tourism in the seventies, with the impact of changing economies, shows no significant detrimental effects on tourism due to a poor economy. This is, we believe, primarily due to the changed attitude toward vacationing as a basic need, to be canceled only if conditions become most dire.

However, our current economic problems are more complex and more serious than the problems we encountered in the seventies, which may therefore lead to more serious actions to solve the problems. One consideration of prime importance in evaluating the impact of forces on the decision-making process of the long-distance vacation travelers is how they perceive the effect of the forces of their own future well-being. The actual economic data are of lesser importance compared to how one's own economic situation is perceived to be when deciding on a vacation destination. We do not believe that a moderate national economic slowdown will have a significant effect on Florida tourism. A severe national economic slowdown may well test how strongly a vacation is viewed as a necessity.

Our second area of concern is the complicated, often contradictory, energy situation. The single factor that can have a serious, immediate detrimental effect on Florida tourism in 1980 is the lack of gasoline availability, or the perception of a lack of availability. This has been vividly demonstrated twice during the seventies.

Our research has shown that continuing escalation in the price of gasoline will not seriously affect tourism unless there is an immediate substantial increase that will have a shocking impact on travelers. Even in that case the impact will be one of a temporary pause, not a long-term decline. As conservation occurs, it takes form in an individual's or family's regular, daily routine. Individual travel and needless trips tend to be eliminated before a family cuts out its annual planned vacation. Most vacations generally include touring as one of the pleasurable activities. Therefore, gasoline availability is the major factor that could have a disrupting effect on tourism.

At Walt Disney World, we had a good fall season and a good Christmas season, which we view as one of the first indicators of tourism for the upcoming year. Our Easter season is another important point in the tourism year.

Because of the obvious importance of tourism to us, we conduct regular tourism research and continuously monitor a number of key indicators. One of our keys is our vacation travel intentions survey conducted three times per year in our major market areas to measure, primarily, long-distance vacation travel intentions for the succeeding three-month period. Our first surveys of this year indicated no immediate reason for concern over the near term.

Another important area that we monitor is the effect on long-distance tourism by changes in economic conditions. The most recent economic factors that show some correlation with our out-of-state attendance also do not point to any serious concerns about tourist flows.

We remain confident in the basic underlying strength of Florida tourism. That strength has been demonstrated many times during the seventies. However, due to the extremely volatile nature of the energy situation and uncertain economic policies, we continue into 1980 with an attitude of cautious optimism. Barring major problems in these areas, we expect good growth in Florida tourism in 1980, probably an increase of 2 to 4 percent over 1979. Similar real increases in tourist expenditures and tourism-related state sales tax collections would occur also.

Our confidence in Florida tourism is supported by our belief that Florida offers what vacationers are looking for, and that people will continue to take vacations and travel. This is not to say that 1980 will be an easy year for the tourism industry in Florida. It will be another year requiring aggressive management and an ability to adapt to a rapidly changing environment. In our judgment, 1980 will be a year of opportunity and we look forward to the challenges ahead.

the state's biggest new tourist

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EPCOT

A good indication of Walt Disney World officials' confidence in the future of Florida tourism is the $800,000,000 EPCOT Center due to open October 1, 1982 — the largest private construction project scheduled in the nation during the next three years.

Ten million visitors annually are expected to be drawn to the two major themed areas of the new center — Future World and World Showcase. Annual visitation at the existing WDW complex has been 14,000,000 for the last two years. Some 8,000 to 10,000 workers will be employed at the peak of EPCOT construction and 8,000 permanent jobs will be created within the new center.

A blend of technology, communication and entertainment, EPCOT Center is receiving major support from leading U.S. corporations and from major companies and governmental agencies in participating nations. (EPCOT is an acronym for Experimental Prototype Community of Tomorrow.)

Card Walker, president and chief executive officer of Walt Disney Productions, said at the EPCOT groundbreaking last October that, "We take this major step forward with great confidence. We have looked carefully, even minutely, at not only the creative aspects of EPCOT Center, but also the economic, the business and the marketing potentials. And, now more than ever before, we know that this is a right and necessary step in the growth of Walt Disney World and, we believe, in the continuing growth of the State of Florida as the most important tourist destination in the whole world."

Standing on some 200 acres of land two miles southeast of the present Contemporary Resort Hotel at WDW, the new center will be linked to other facilities by monorail.

WDW Vice President Robert C. Allen, speaking at a January economic outlook conference, described EPCOT as follows:

"Standing at the entrance to EPCOT Center, the Spaceship Earth Theme Show is included in a 178 foot elevated globe representing the earth. Visitors will learn that just as the industrial revolution has elevated us into the twentieth century, the communications era is propelling us to the twenty first.

"As the spaceship guests arrive, they go into the Future World to the many purveyances affecting the future of humankind. The Energy Pavilion presented by Exxon is designed to make a strong visual statement by showcasing a working demonstration of solar energy.

"The Land Pavilion, a presentation of Kraft, Inc., will focus on the earth as a garden to be cultivated for its own and man's most beneficial use.

"The Transportation Pavilion will show how our civilization has progressed through time in direct relation to our freedom of mobility. In this pavilion presented by General Motors, visitors will see the earliest and most humble transportation designs grow and change as mankind reaches out to explore the world. Then they will be treated to simulation trips aboard some of today's most exciting modes of transportation. And, finally, they will preview emerging transportation systems for the future.

"Also, plans are in the conceptual stage for a pavilion dedicated to the most precious of all human resources — the imagination. We are very excited about that." Other sections of Future World will focus on the seas and on science and inventions.

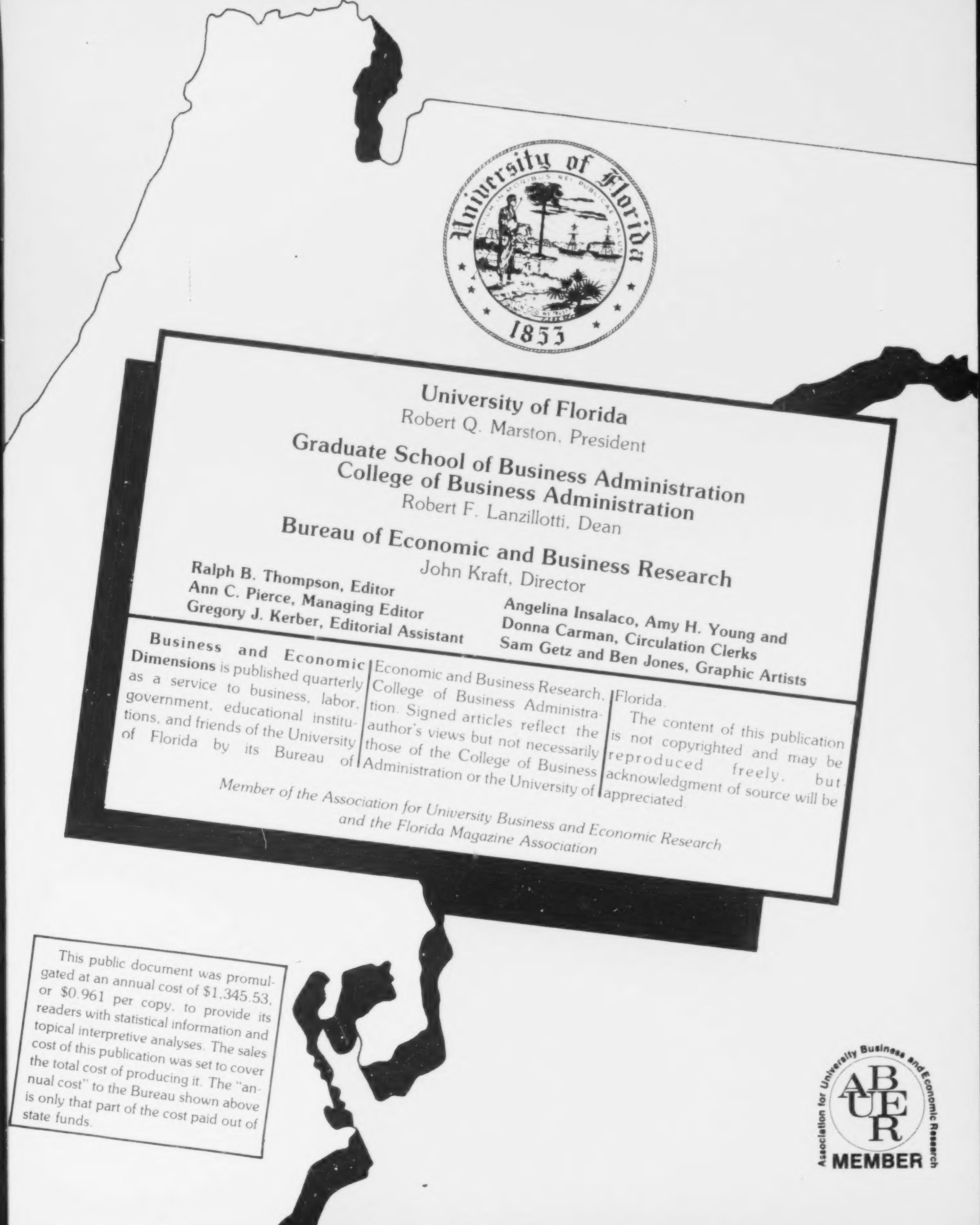
World Showcase, as described by Vice President Allen, will be a place "where nations of the world will stand side by side along the banks of a broad lagoon . . . represented in pavilions uniquely designed to show their diverse customs, their goods and peoples. Their presence will give life to the idea that these divergent cultures have common aspirations that make us all in the end a universal man. I do not recall another time in history where that might be more important."

Some of the highlights of World Showcase include:

- a cruise down Germany's rivers through photographs of its major landmarks;
- a safari through Africa;
- a train ride through the countryside of the United Kingdom;
- a replica of Tokyo's nighttime shopping and entertainment district;
- gardens, aviaries and plazas typical of Costa Rica;
- the performing arts of Mexico;
- representations of the exotic tradition of Morocco;
- the classic grace of Italy's architecture;
- a tour of Canada's wilderness, cities, landmarks and people;
- history, growth and expanding frontiers of America in the World Showcase host pavilion, The American Adventure.

Allen called the Center "a statement of the need for the people of the world to come together in the spirit of cooperation . . . and a statement about the possibilities of technology in the free enterprise system.

"We hope we can offer through EPCOT Center a statement about the future," he said. "You see, we really believe in the future."



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